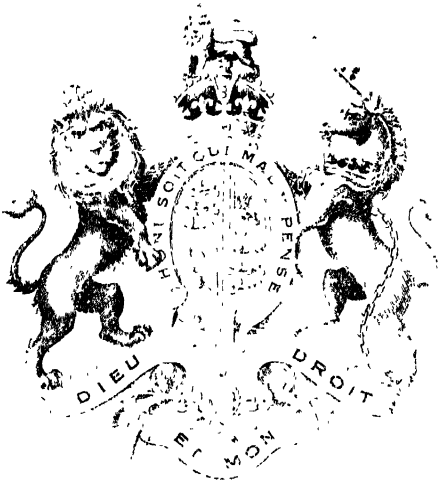

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AGRICULTURAL RESEARCH INSTITUTE

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## REPORT ON DISEASES AFFECTING THE TROOPS AND ANIMALS OF SIERRA LEONE.

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*Royal Army Medical Corps*

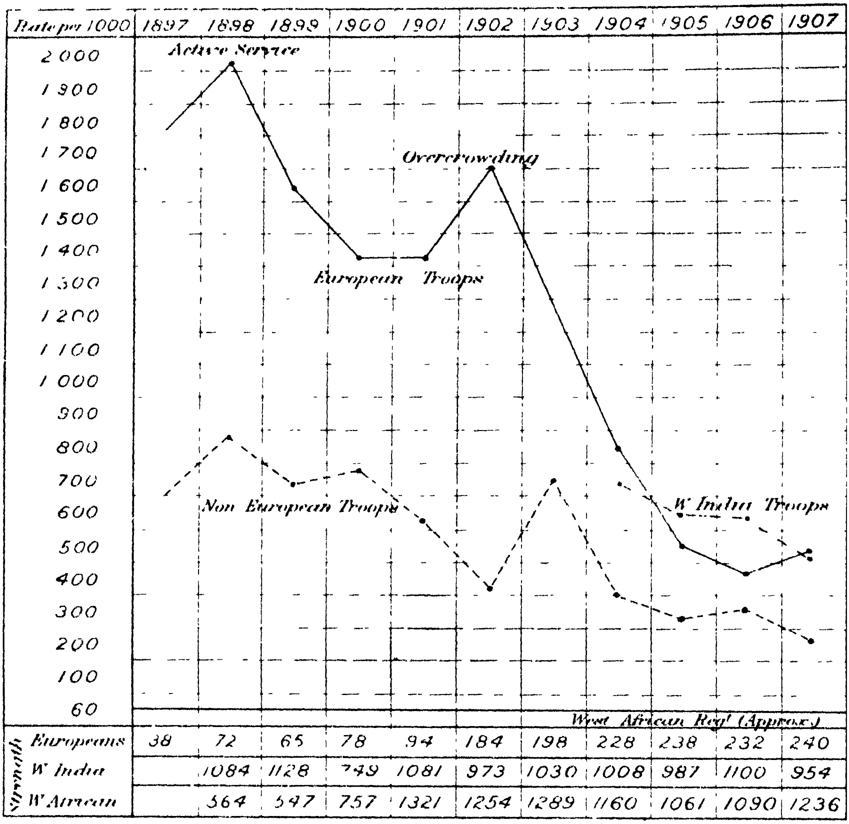
### SECTION I

### PRINCIPAL DISEASES AFFECTING THE TROOPS.

### *Malaria.*

THE relative importance of this infectious disease being out of all proportion to the other diseases in the command, it is considered first. The following chart is compiled from the Army Medical Reports and the Annual Returns. It shows the admission-rates per 1,000 for malarial fever in the Command, and the various strengths.

The curves on the chart would be misleading without some explanation of the local topography, the population and its distribution, especially in the case of non-Europeans. It can be seen that the indigenous West African native enjoys, as an adult, a relatively high degree of immunity, the rate for the West African Regiment being only 60 per 1,000 as compared with 650 and 517 in 1906-7, respectively, of the West Indian troops. This represents a very different state of affairs from what is actually shown in the Army Medical Reports as the non-European rate. The European rates up till 1902 were based on such small numbers as to be almost valueless when shown in a continuous curve per 1,000. The striking drop from 1902 onwards is discussed later.



| Strength | 1897 | 1898 | 1899 | 1900 | 1901 | 1902 | 1903 | 1904 | 1905 | 1906 | 1907 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Europeans | 38 | 72 | 65 | 78 | 94 | 184 | 198 | 228 | 238 | 232 | 240 |
| W. India |  | 1084 | 1128 | 749 | 1081 | 973 | 1030 | 1008 | 987 | 1100 | 954 |
| W. African |  | 564 | 547 | 757 | 1321 | 1254 | 1289 | 1160 | 1061 | 1090 | 1236 |

*Topography.*—The following sketch[1] shows diagrammatically the present position of the chief groups of anopheles pools in Freetown, which groups I have represented by dots.

*Tower Hill* may be regarded as a small *non-malarial oasis,* in the midst of a densely populated and malarious tropical town of about 40,000[2] inhabitants, inhabited by a mixed native population with a sprinkling of Europeans. This opinion is based on the fact that neither the members of the 1899 expedition,[1] nor any of my predecessors, nor I myself have ever been able to find one anopheles mosquito at Tower Hill barracks. Further, every case of malarial fever occurring among the troops at Tower Hill can be traced to some highly probable source of infection outside, usually in the town. This absolute freedom of Tower Hill from anopheles demonstrates the value of: (1) The cleared zone of grass-covered slope, varying in width from 250 to 500 or 600 yards only, which completely encircles the barracks, built centrally on the ridge-shaped summit, about 200 ft. above the nearest native houses. (See sketch.) (2) The ordinary military standards of surface drainage, conservancy and ventilation. (3) The encouraging fact, which should be of interest to those engaged in West African anti-malarial sanitation, viz., that the prevalent anopheles mosquito (*P. costalis*), which is responsible for most of the fever on this coast, is so domesticated and localised in its habits that it will not apparently take the trouble to cross this comparatively narrow zone of 250 yards.

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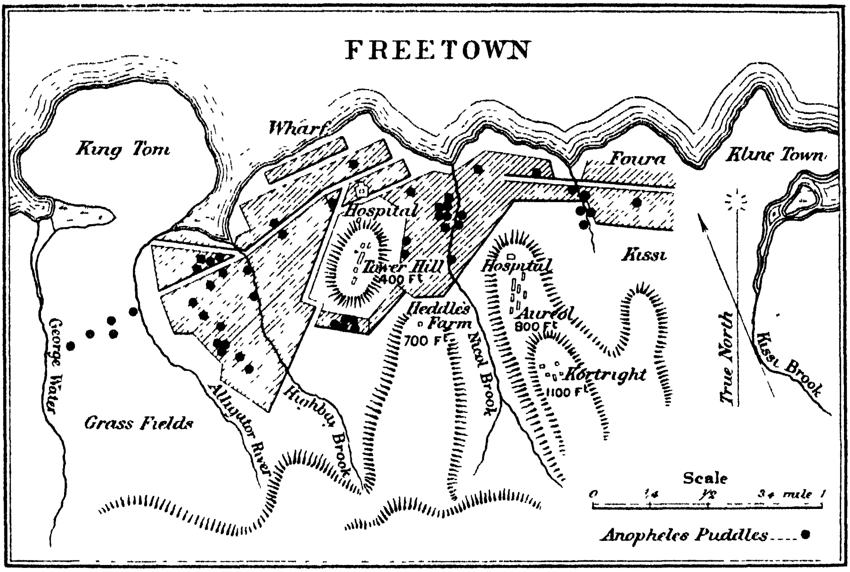
[1] Journal of the Royal Army Medical Corps, 1906, p. 697, article by Major F. Smith, D.S.O., R.A.M.C., "Certain Forms of Fever, and the Conditions Bearing Thereon, in the Hill Stations of Sierra Leone."

[2] Based on 36,071 from the last available (1905) Annual Report of the Medical Department of Sierra Leone, compiled by Dr. Prout (Civil Principal Medical Officer).



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[1] Liverpool School of Tropical Medicine, including Mr. E. E. Austen, the eminent dipterologist.

*The Population and its Distribution.*—On analysing the European rate per 1,000, it is noted that the population from which this rate is constructed is situated under the most variable conditions. Thus the endemic index of Tower Hill may be said to be *nil.* That of some of the bush stations and native villages, where a few European N.C.O.'s of the West African Regiment live, may be taken in some cases at 100 per cent. Somewhere between these limits is the endemic index of Freetown, where, until recently, a small number of N.C.O.'s lived,[1] owing to the lack of accommodation at Tower Hill. However, when the rate for actual residents at Tower Hill for 1906 and 1907 is worked out, it only reaches 30 per 1,000[2] lower, which is a comparatively insignificant difference, owing to the relative smallness of the number concerned who live outside Tower Hill.

*Mount Auriol* (*including Kortright*).—This station, on the other hand, cannot be regarded as free from endemic malaria, and thus differs from Tower Hill. It also differs strikingly in its topographical features, by reason of much greater altitude (see sketch), the extreme steepness and very rocky nature of the ground, the close proximity of the bush and certain mountain torrents. Owing to these features, *M. funesta,* a typically bush (anopheles) mosquito, which breeds in rock- and tree-holes, or empty tins concealed by undergrowth, representing, as far as the mosquito is concerned, so many rock-holes, can still be found there.

In addition there are certain remediable conditions, such as defective conservancy by the native contractors, holes in trees, want of sufficient bush clearance and of efficient surface drainage. Great improvements, however, have been effected during 1907 under the new sanitary organisation, in the direction of bush clearance; but the rock-holes in the beds of mountain torrents, &c., are irremediable without enormous labour and expense. The new sanitary cadre picked up in the adjacent bush, it is estimated, 80,000 tins in which anopheles larvæ were found. They have also cement-filled several hundred tree-holes. Mosquito nets have recently been issued to the West India Regiment now at Auriol. It is probable, however, that this will not have any very marked effect on the malarial rate, as I am informed that nearly one-third of the regiment have permanent passes, and many have wives and families in Freetown. If it were possible to find quarters for the latter at Auriol (or Kortright) they could be brought under sanitary control and a great improvement would be effected. The difficulty is the very limited nature of the site available and the fact of the gradual disbandment of these troops.

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[1] This has now been provided against.

[2] I am indebted for these figures, to Captain D. S. Skelton, R.A.M.C., who kindly worked out the Tower Hill factor.

*Conclusions.*—Having now discussed the differences in the malarial topography of Mount Auriol and Tower Hill, we are in a position to criticise the striking drop which occurred in the European malaria-rate from 1902 and onwards, and to draw certain conclusions therefrom. It is essential, however, to bear in mind two points:—

(1) The bulk of the European troops lived at Auriol until the end of 1905; (2) early in 1903 they were supplied with mosquito nets.

The drop, therefore, represents the elimination of the endemic infection at Mount Auriol by nets. When the European troops moved to Tower Hill, a malaria-free barracks, in December, 1905, no further reduction was observed, nor can it be expected. In fact, we may expect a slight rise, owing to the fact that the town is within a very short distance of Tower Hill, compared with the long and arduous climb to Mount Auriol barracks. Therefore, we may be said to have reached the "irreducible minimum" malaria-rate as far as European troops are concerned, and which is dependent entirely on the endemic index of Freetown. Against this the only measures we can take are the impracticable one of confining every man to barracks after, say, 6 p.m. or 7 p.m. during the whole of his tour, education, and action by the municipal and civil government authorities.

*Note*—It should be noted that the question of quinine prophylaxis has not been touched, as this has been a constant factor all through, and was in operation long before 1902.

Referring to recent statements regarding the prevalence of malaria in Sierra Leone, Major Ronald Ross recently stated at the International Congress of Hygiene, Berlin, September, 1907, that, having visited Sierra Leone in 1899 with the Malaria Expedition under the auspices of the Liverpool School of Tropical Medicine, the Government was most fully advised as to the exact methods that might be followed, . . . and that it was considered a practically easy task for the authorities, being chiefly a matter of simple surface drainage and hole-filling. He estimated that £20,000 would have paid for the exsiccation of the whole town, and £500 a year for maintenance.[1] All that actually happened was that one man was employed to treat pools with kerosine, and his services were dispensed with subsequently.

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[1] JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, February, 1908, p. 159.

Dr. Prout, in his Annual Report for 1904, states: "The City Council will not authorise the purchase of a further supply of crude kerosine." In 1905 a clause was included in the new Sanitary Ordinance, making it a punishable offence to have collections of water containing mosquito larvæ in a yard. This was referred to recently by Dr. Prout at Exeter, at the meeting of the British Medical Association (Tropical Section), August, 1907, as a law which ought to be extended to other Colonies and strictly enforced. The Commissioner of Police informs me, however, that he has never yet heard of a prosecution under this clause. Dr. Prout, in all his Reports, refers to the "great abomination of Freetown, its foul system of cesspits." I do not think that anyone will disagree with this statement, which has also considerable bearing on the malarial question.

In 1906 a sum of £2,223 appears to have been spent in repairs to streets and laying down concrete surface drains. A complete segregation area, with bungalows and a mountain railway, has also been created within the last three years. This is a great boon to a limited number of civil Government officials, costing, I have been informed, over £100,000, including the mountain railway, which is worked at a loss. These improvements, however, are no solution of the question of the health of Freetown, and have probably retarded sanitary progress there.

The finances of the Colony are, I believe, prosperous, showing £20,000 surplus for 1906, and recently about £50,000 was allotted for road construction in the Protectorate.[1] Want of progress in the anti-malarial sanitation of Freetown is undoubtedly due to the fact that the municipal control is entirely in the hands of native Creoles, whose inertia and industrial inefficiency are an index of the many decades of malarial saturation, chronic ill-health and huge infant mortality from which the population suffers. However, now that plague has broken out at Accra, Gold Coast Colony, its advent at Sierra Leone, sooner or later, is probable. This will stimulate sanitation and thus prove a blessing in disguise.

### *Blackwater Fever.*

*Prevalence.*—The prevalence of this disease for 1907 is shown as follows:—

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[1] The sums are only approximate and not official.

| | Admissions | Deaths |
|---|---|---|
| European troops | 3 | 0 |
| West India troops | 6 | 1 |
| West African Regiment | 0 | 0 |
| Total | 9 | 1 |

On comparing these figures with the malarial chart the ratio of frequency between the two diseases is seen to hold good for the three different types of population. It is most unfortunate that this ratio cannot be traced back as a curve for previous years, owing to the "Nomenclature" taking no notice of blackwater fever as a separate item before this year. There is probably very little doubt that the annual prevalence of blackwater fever would in the same way correlate directly with the malarial rate.

*Mortality.*—Captain D. S. Skelton, R.A.M.C., informs me that he has a record of twenty-seven cases (in 1906-7), including the above, twenty-two of which came under his personal observation, the death-rate being 7·4 per cent. Major H. W. Grattan, R.A.M.C.,[1] states that a total of ten cases occurred in 1905 amongst the garrison, all from the West India Regiment, with one death. This compares very favourably with death-rates noted elsewhere.

| | Death-rate per cent. |
|---|---|
| German East Africa (Stendel) | 16–17 |
| Gold Coast (Reynolds) | 50 |
| Sierra Leone (Prout) | 20–30 |
| Senegal (Beranger Ferand) | 23–34 |
| German East Africa (Koch) | 42 |
| Manson's Text-book | 20–30 |

An analysis of our cases shows that the death-rate was most markedly influenced by the stage at which the patient came under medical observation and, coincidentally, skilled nursing.

*Treatment.*—Quinine and other drugs appeared to have no influence on blackwater fever. Captain D. S. Skelton informs me that of fourteen cases treated with *Cassia beareana* one died. In ten cases quinine was given, in doses of not less than 10 grains hypodermically, or 50 grains *per rectum*, with no apparent ill-effects, except in one fatal case not included in his series. In this fatal case a relapse occurred soon after the rectal administration of the quinine. Some cases appeared to improve markedly under quinine. Atoxyl was given hypodermically in two cases, one of which, a Creole woman,[2] died the next day. As it was subsequently found that this latter drug produced acute and fatal inflammatory effects on the kidney in some of the laboratory animals experimentally infected with trypanosomiasis, it would appear somewhat unsafe to use it in blackwater fever cases, where the integrity of the kidney is all-important. Other cases did just as well with no drugs at all. Normal saline injections always appeared to be of great value. Some medical officers, especially the Colonial Staff, are very much in favour of the so-called Sternberg treatment, as used in yellow fever. This treatment consists in giving sodium bicarbonate to counteract the hyperacidity of the gastric and intestinal contents, and perchloride of mercury to check fermentative changes. This treatment is adopted in blackwater fever on the assumption that there is an undue acidity of the blood,[1] and it has been suggested that the hæmolysis may be due to a sort of malarial acid diathesis similar to scurvy. Examinations were made with a view of finding out whether blackwater fever made any difference to the alkalinity of the blood. The actual differences found were so trifling as to be practically negligible. These results appear rather to dispose of any such theories.

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[1] Journal of the Royal Army Medical Corps, September, 1907, p. 237.

[2] No *post-mortem* was allowed in this case.

### *Beri-beri.*

Two sporadic cases of this disease occurred amongst the West African Regiment. These troops live under native conditions in mud barracks, consisting of tin-roofed hutments, two, three, or more to a hut. According to European standards, there might be said to be considerable overcrowding, as the majority of these soldiers have one or two wives and their families living with them. Sections of the duodenum in fatal cases showed necrotic conditions, and there were clumps of short, blunt-ended bacilli in the deeper layers of the mucosa, which may have been either Hamilton Wright's bacillus or merely *post-mortem* micro-organisms. No nerve trunks or other tissues were sent for examination.

### *Small-pox.*

No cases were notified during the year. As small-pox is endemic amongst the civilian population, the value of primary vaccination of all recruits of the West African Regiment is very striking. The importance of this question to military expeditions on this coast must be recognised sufficiently early to allow of the wholesale vaccination of the hundreds, or even thousands, of carriers employed, who are collected from all parts. Among these carriers small-pox has often broken out, necessitating large isolation camps on the lines of communication, seriously hampering operations and causing great wastage.

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[1] Prout, "On the Treatment of Blackwater Fever," British Medical Association, 1907, at Exeter.

### *Syphilis.*

This disease is very prevalent amongst the native and Creole population. The troops do not appear to suffer more than in other tropical stations.

### *Tubercle.*

This disease is also very prevalent among the native population. Six cases of pulmonary tubercle were notified from the West India troops with two deaths, and one case from the Sierra Leone Royal Garrison Artillery.

### *Ankylostomiasis.*

Captain A. H. Morris, R.A.M.C., in his Annual Sanitary Report, 1906 (Sierra Leone), states that he found 56·1 per cent. of non-Europeans infected.[1] We are inclined to think that even a higher figure might be given.

### *Filariasis.*

Young filaria were found in anopheles (*P. costalis*) on dissection at the rate of 25 per cent. and zygotes 5 per cent. only. A rough cover-slip examination of the West African Regiment at night revealed 16 per cent. infected, with sheathed embryos in the peripheral blood (*F. nocturna*). None were found by day. None of these cases had any symptoms. Elephantiasis is fairly common in Sierra Leone, and enlargements of lymphatic glands are excessively common. Practically all cases show a high degree of eosinophilia.

### *Sun Traumatism.*

*Etiology.*—Considerable attention is drawn to this often serious class of injury, which is not only comparatively common, but in many cases is wrongly returned, diagnosed, and treated as malaria. The more commonly known forms—acute sunstroke and heat apoplexy—such as are found on the plains of India or in the stokeholds on the Red Sea, &c., are almost unknown here. A glance at the comparative meteorological charts found in the appendix of the Army Medical Department Reports will explain this. Not only does the period of greatest humidity coincide with the lowest temperature range, but the temperature range itself is abnormally low for the latitude (8° N. of the Equator). It is no doubt owing to this fact that people in Sierra Leone are apt to disregard the sun to some extent; also when they get ill, the disease is casually called remittent fever. Further, during the prolonged dry season the temperature is to a great extent kept down by the *harmattan*, or dry wind from the desert, which is not only cooling in its effect, but spreads a mantle of exceedingly fine and often imperceptible red sand through the atmosphere, which undoubtedly absorbs a large portion of the actinic light from the sun. In addition to this, the peculiar red volcanic soil, which is said to contain a large amount of titanic acid, has most marvellous absorbent and oxidizing properties. Dr. Forde, Civil Principal Medical Officer, informs me that excreta in Hill Station is turned into mould in five days in trenches. This and the perfect water supply no doubt account for the remarkable absence of enteric and dysentery.

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[1] Journal of the Royal Army Medical Corps, September, 1907, p. 299.

*Symptoms.*—With regard to symptoms, the description given in Manson's text-book exactly resembles the type of case met with here: "After prolonged exposure to the sun a febrile condition is established. This is sometimes of great severity, being characterised by intense headache, rapid full pulse, pungent dry skin, intolerance of light, sound and movement, and, occasionally, vomiting and delirium."

Usually the cases here only last about seventy-two hours, but some drag on occasionally for three or four weeks, with slight jaundice and a low remittent type of pyrexia, causing considerable debility and even sequelæ, such as loss of memory, irritability of temper, &c. A differential leucocyte count is essential for the diagnosis of most of these cases, the deciding point being the absence of any mononuclear increase over 12 to 15 per cent. The diagnosis is important, as these cases do better without quinine, and it is unfair to the returns to casually call them remittent fever. In many other stations a precisely similar type of case is often returned as simple continued fever,[1] apart, of course, from ambulant Malta fever or typhoid, which has been often included under this heading.

*Pathogenesis.*—The great length of exposure necessary out here, in order to get good photographic results, amply demonstrates the comparatively low actinic index. Newcomers are invariably deceived and under-expose their plates, till they find this out by experience. The possibility of there being solar rays, other than ordinary heat and actinic rays, is therefore, from analogy of the effects of the Röntgen rays, quite feasible and highly probable.

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[1] "Simple Continued Fever in Malta," by Lieutenant-Colonel Gerrard, JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, November, 1907.

*Prevention.*—On this assumption, a material composed of yellow, blue, and red threads interwoven has been devised which claims to arrest in a great measure these injurious rays.

It has been found by experiment that the pigmented skin of the negro has a very much stronger absorptive power towards the ultra-violet rays than the pale skin of Europeans. In accordance with these facts, black, red, or orange clothing should be worn by white men. The above material produces a reddish-yellow colour screen on its inner surface, with the appearance of ordinary khaki outside.

*Experiment.*—On testing this material against others at the laboratory, the following results were obtained, the protection from the sun afforded by each kind of material, as registered by an actinometer and a sun thermometer, being recorded.

| | Sun, 140° F. | Khaki drill | New material | Cellular aertex | Regimental grey flannel | Thick khaki flannel |
|---|---|---|---|---|---|---|
| Heat rays .. | .. | 101° F.<br>in 18 mins. | 106° F.<br>in 10 mins. | 110° F.<br>in 5 mins. | 105° F.<br>in 5 mins. | 102° F.<br>in 10 mins. |
| Actinic rays .. | Shade, 90° F<br>3 secs. | 45 mins. | 15 mins. | 4 secs. | 2 mins. | 3 mins. |
| Weight .. | .. | (coat)<br>26 ozs. | (shirt)<br>20 ozs. | (shirt)<br>10 ozs. | (shirt)<br>20 ozs. | (shirt)<br>18 ozs. |

It will be seen, therefore, that no advantage was obtained in the matter of heat rays, but with regard to actinic rays the result is quite striking, the protective value of the new material over regimental grey flannel being $\frac{15}{2}$. It is a comparatively thin and light woollen fabric eminently suited for wear in the Tropics. Khaki drill is, of course, out of the question as a material to be worn next the skin, and, if used, involves the weight of a coat and shirt (46 ounces). From a practical point of view, however, several officers who have recently taken to using the new material in the local bush for shirts, helmet covers, umbrellas, &c., have testified as to its valuable protective properties compared with ordinary materials. Undoubtedly, a tunic or bush-shirt made of it would be ideal clothing for European troops on the West Coast of Africa. The khaki drill coat would then be superfluous, and the saving effected would probably pay for the issue of tunic shirts of the new material, not to mention the increased comfort from the absence of prickly heat often caused by the regimental grey flannel shirts.

## SECTION II.

*Trypanosomiasis in Animals.*—The prevalence of human trypanosomiasis in Sierra Leone has already been investigated by my predecessors, Captain A. H. Morris and Major H. W. Grattan, R.A.M.C.[1] The accompanying spot map has been continued, and now shows the distribution of the tsetse-flies and of human and animal trypanosomiases.

We may here note that *Glossina fusca* is very much less common than *G. palpalis*, and that we have only one specimen of *G. pallidipes*, which was sent to the laboratory for identification by Surgeon McCloy, R.N. (H.M.S. "Mutine"), who caught it at Cestos Bay on the Liberian coast, a few miles south of Sierra Leone. This fly, though common on the East African side of the Equatorial zone, has been, we believe, hitherto unknown on this side.

With regard to *G. palpalis*, which is apparently omnipresent in Sierra Leone and is most easily found along river banks, where in some places it positively swarms, it is of considerable importance to record that we have also found this fly at altitudes of 400 feet to 900 feet and even higher, a long distance from any water or river banks. Favourable conditions appear to be chiefly the presence of food, in the shape of dogs, children or cattle. In these situations we have frequently found dogs infected with trypanosomes, from which infection they invariably died sooner or later. A notable instance is the plateau of Wilberforce and Hill Station, where the cantonment of the West African Regiment is situated, and where large areas of bush have been cleared. Cases of human trypanosomiasis have occurred there, but the disease has shown no tendency to spread.

There may be some unexplained relation between the human and this animal trypanosome. It is further possible that all cases of the former do not end in sleeping sickness, and that some cases may eventually recover from the infection completely. However, I am unable to prove this.

It is very interesting to note that sleeping sickness has been known in Sierra Leone for over one hundred years, and it has not apparently increased to any extent, more probably diminished. There may be, therefore, some unknown factor governing the situation, and we might not unreasonably assume that this factor is absent in other parts of Africa, where the disease is known to be greatly on the increase. Contagion by sexual intercourse is unsatisfactory as a tenable view. There are also plenty of crocodiles in the rivers of Sierra Leone. (We may further note that we have failed to find trypanosomes in ticks fed on heavily infected animals.) It would, on the whole, point rather to something wrong with the transmission theory, mechanical or otherwise, by means of glossina, in relation, at least, to the prevalence of human trypanosomiasis in Sierra Leone. Merely as a suggestion, there appears to be a possibility that might be worth investigating, The so-called *Trypanosoma grayii*, which has been found in the proventriculus of the tsetse-fly, is said to encyst, after the manner of a herpetomonas, and is possibly excreted in the same way. When the tsetse-feeds, a whitish fluid is often passed *per anum*, and it might be just possible that the seat of puncture of its vertebrate host could be inoculated with this material in the same way that the plague germ is inoculated by the flea. The puncture of a tsetse-fly is a comparatively large one, and bleeds readily, and the distance from the puncture to the site of the anal excretion is not much more than the length of, say, three fleas. This distance could easily be bridged over by the exuded blood and the above-mentioned whitish fluid.

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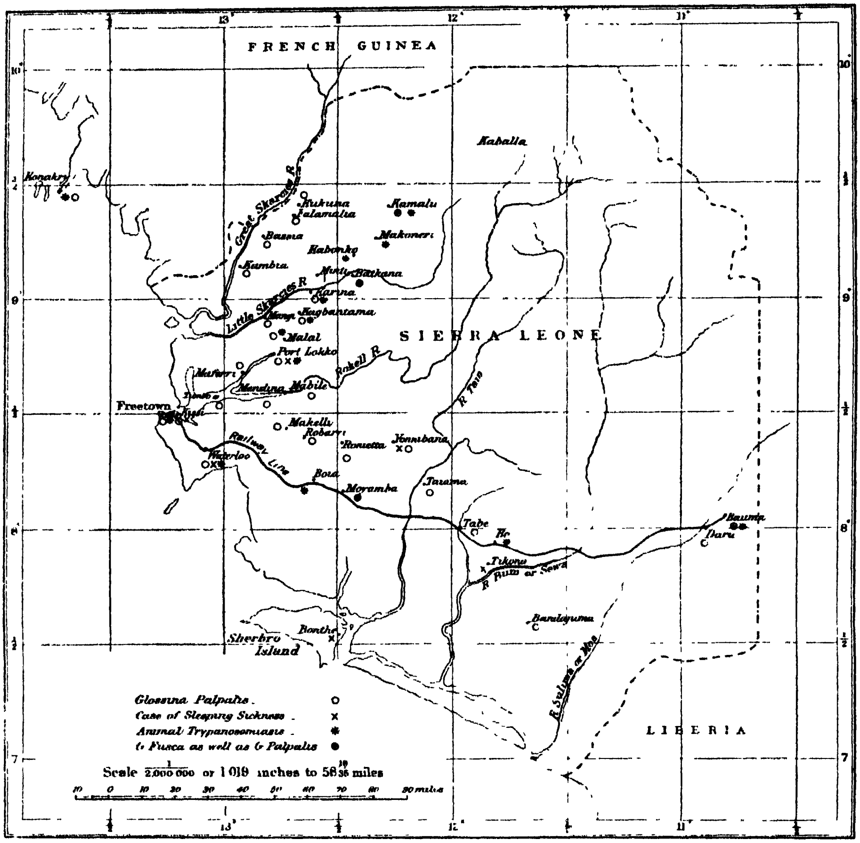
[1] JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, May, 1906, and September, 1907.

Failure to infect by means of *T. grayii* or the gut contents of tsetse-flies might merely mean that the (?) *cysts* or (?) *encysted* sporozoits of these trypanosomes only were infective, and not when in the gamete stage, if we can imagine *T. grayii* to be gamete forms of an original vertebrate trypanosome. Some observers (Koch, &c.) have certainly favoured the view of there being male and female forms in the gut of the tsetse-fly. In any case it is highly improbable that these trypanosome forms get into the gut for no purpose, a proceeding which would be contrary to the laws of parasitism. However, against the above it might be urged that these so-called trypanosomes (*T. grayii*, &c.) are merely herpetomonas themselves. In any case the distinctions on these points are at present none too clear.

The line of work followed during 1907-8 has been the investigation and experimental treatment of trypanosomiasis in animals, a subject of great economic importance to the Colony, both from a civil and military point of view. As owing to the excessive mortality amongst four-footed animals the only transport, with the exception of a single line of railway and canoes up some of the creeks, is entirely by means of human carriers. The mountain battery is man-carried, and the great problem of local military expeditions is transport, often necessitating the employment of thousands of carriers. Of not less importance to the Colonial Government are the continued heavy losses in stock sustained by the native population.

*Historical.*—In 1904 Major F. Smith, R.A.M.C., discovered a trypanosome in a blood-film taken from a dead ox at Sierra Leone somewhere near Port Lokko.[1]



SPOT MAP, SHOWING DISTRIBUTION OF TSETSE-FLIES AND TRYPANOSOME DISEASES.
. Small dot = position of town.

There is no record of any subsequent work, although it appears that animals were frequently examined, with negative results. . . . In 1907 I proceeded to examine all the cattle and horses in a strip of country between Port Lokko and Kamalu about sixty miles in length. Over 650 head of cattle in all were examined, including a few horses, the latter being very scarce.[1] The investigation was then continued in Freetown[2] and its environs, at Waterloo, and later on at all the principal towns up the railway line (see map). A trypanosome was eventually found in cattle, horses and dogs, and was put through a series of passages at the laboratory.

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[1] JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, 1904, vol. iii., p. 330.

This trypanosome was found to increase in virulence by passage through the same species. Guinea-pigs appeared most refractory and puppies least so. A natural strain from the horse appeared non-infective for dogs, but the cattle and dog strains were infective for horses. It is possible, therefore, that these may be two distinct strains; further work is required to settle this point. This trypanosome appeared to be invariably fatal and most widely distributed, and at one place, Minti (see map) there were only two dying cattle left out of sixty. At Freetown, cattle are mostly imported by steamer from Senegal and other places up the coast, and are usually killed and eaten before they have time to show signs of disease. The natural infection in bovines and equidæ appears to be usually so insidious that it often escapes observation, and trypanosomes are equally difficult to find. It was only by the injection of small susceptible animals, such as puppy-dogs, &c., with large quantities of blood that we were able to demonstrate the prevalence of this disease. It was probably owing to this difficulty that previous observers failed.

In some of our laboratory inoculations, animals died without ever showing trypanosomes, but subinoculations were positive.

*Morphology.*—This trypanosome is probably *T. dimorphon*, for the morphology of which the reader is referred to Laveran and Mesnil (pp. 240, *et seq.*), 1907, translation by Nabarro. It is only necessary to observe here that we have most frequently found the "tadpole" and "stumpy forms," with flagellum very short or absent. The undulating membrane is visible, but not often easily made out. Major Grattan, R.A.M.C., to whom we sent stained specimens, very kindly measured them at the Royal Army Medical

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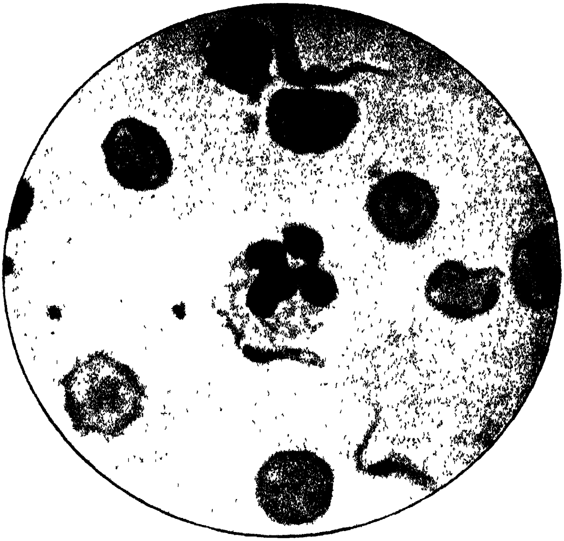
[1] Note on the "Investigation of Cattle Diseases in Sierra Leone," by Captain F. Harvey, R.A.M.C., JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, January, 1908.

[2] Six mules belonging to the Public Works Department were examined; they had been in Freetown for ten years, all were apparently healthy. These mules were stabled in the centre of the town and only used in the town itself.

College, and gave 13·5 μ as the average length. At the laboratory at Sierra Leone our own measurements slightly exceeded this average by about 1 μ or 1·5 μ. We have also found much longer forms. This trypanosome exhibited the characteristic movements as described in my preliminary note. Specimens were sent to Professor Mesnil at the Pasteur Institute, who very kindly replied :—

"Il y a peu de doutes que votre trypan soit le *T. dimorphon* (*sensu stricto*)."



*Geographical Distribution.*—The geographical distribution of this trypanosome, which is of the nagana type, and dependent on the tsetse-fly, is probably much wider than was at first supposed, the Gambia, Haut Niger, French Guinea, possibly Bahr-el-Ghazal (Sudan), the Congo basin and Sierra Leone being all now included in its range of prevalence.

*Note.*—Presuming it to be *T. dimorphon*, and assuming it to be a distinct entity from *T. Brucei*, mere differences in length alone or polymorphism in trypanosomes cannot be accepted as distinctive evidence in warranting a species.

"It is therefore permissible to suppose, says Martin, that a wide belt of the African continent, parallel with the Equator and extending from Gambia and Guinea on the west to the Anglo-Egyptian Sudan and Uganda on the east, is infected with *T. dimorphon*" (p. 230, Laveran and Mesnil, 1907).

INOCULATION EXPERIMENTS.

| No. of experiment | Animal | DAYS AFTER INOCULATION | | Remarks |
|---|---|---|---|---|
| | | Trypanosomes first seen | Died | |
| 1 | Puppy "Spot" .. | 17 | 30 | Direct from bullock at Kamalu. |
| 2 | Guinea-pig .. | *Nil* | 13 | All usual symptoms. |
| 3 | Pup "Pellico" .. | ,, | 71 | Inoculated from 2. |
| 4 | Goat Mark 1 .. | 11 | 19 | — |
| 5 | Pup "Lomingo" | 7 | 13 | — |
| 6 | Bitch Mark 1 .. | 23 | 78 | Strong, full-grown dog. Accidentally poisoned 78th day. |
| 7 | Two guinea-pigs | *Nil* | — | Alive at R.A.M. College, 6 months up to date. |
| 8 | Goat Mark 2 .. | 14 | 25 | Not allowed to land in England, and was destroyed. |
| 9 | Pup "Member" | *Nil* | 23 | Usual symptoms.<br>Both inoculated from infected animal 2 hours after death. |
| 10 | Pup Mark 2 .. | ,, | 40 | Accidentally poisoned. |
| 11 | Pup "Squeaker" | ,, | 16 | Usual symptoms. |
| 12 | Goat Mark 3 .. | 26 | 50 | Inoculated from No. 11, in which trypanosomes were not found. |
| 13 | Pup "Fineboy" | 14 | 20 | Usual symptoms. |
| 14 | Pup "Floss" .. | 16 | 21 | |
| | | | | *Treatment.* |
| 15 | Bitch "Polly" .. | 23 | 50 | (1) Alcoholic solution methylene blue and HgCl (1 : 500), 2 cc., in 5 doses subcutaneously; no effect, very rapid coagulation rate. |
| 16 | Dog "Coker" .. | 36 | 70 | 2 per cent. (as in No. 15), 31 cc., in 13 doses. Started on 1st day of appearance of trypanosomes; marked improvement at first. Trypanosomes not seen for 9 days. Disease converted into chronic type. Rapidity of clotting a difficulty; citrate of soda (10 grs.) daily improved this markedly, so that pipettes could be used again. Hæmoglobin rate started at 70 per cent., declined steadily all through—20 per cent. before death. |
| 17 | Pup "Sandy" .. | 14 | 18 | 2 cc. of 5 per cent. atoxyl; no effect. |
| 18 | Pup "Ginger White" | 14 | 50 | Injections commenced 15th day after inoculation; 1 per cent. methylene blue alcoholic solution and HgCl in 10 doses, 7 cc.; 2 per cent. in 2 doses, 3 cc. Slight improvement; trypanosomes absent first two days after treatment commenced. Atoxyl 5 cc. in 3 doses was given finally. Hæmoglobin 70 per cent., fell steadily to 34 per cent. Nephritis. *Post mortem.* |
| 19 | Pup "Lily" .. | 15 | 50 | Treatment commenced 25th day after inoculation; 2 per cent. alcoholic solution of methylene blue and HgCl, 26·5 cc., in 12 doses. Hæmoglobin, from 70 per cent., fell to 32 per cent.; lipæmic appearance of the blood. Considerable improvement at first, and no trypanosomes found for 9 days after treatment, and then only scanty and intermittently till death. Disease assumed a chronic type, showing swollen feet, loss of hair and raised papules, &c., extreme wasting and dragging of hind legs. On the 46th and 48th days 2·5 cc. atoxyl given. Died. Nephritis found. |

INOCULATION EXPERIMENTS.—*Continued.*

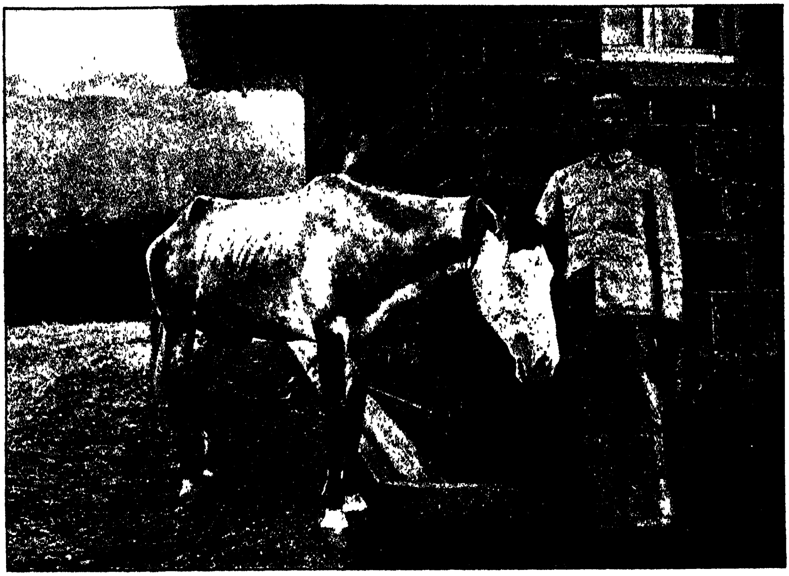
| No. of experiment | Animal | Days after inoculation | | Remarks |
|---|---|---|---|---|
| | | Trypanosomes first seen | Died | |
| 20 | Pup "Blackie" | 14 | 50 | Treatment commenced 15th day after inoculation; 2 per cent. alcoholic solution of methylene blue and HgCl. No trypanosomes seen after 12th injection, and only seen once again. Disease became chronic, as in No. 19—papules, hair falling out, swollen feet, paralysis of hind limbs, &c. Hæmoglobin rate 60 per cent. at start and fell to 20 per cent.; gradual decline, but remained stationary for some time during treatment; 5 cc. atoxyl (5 per cent. solution) given on 46th and 48th days in 2 doses: no effect. Nephritis at *post mortem.* |

From the foregoing experiments it will be seen that the virulence of this trypanosome varied considerably, according to the previous passages and ages of the animals subinoculated. In Experiments 1 to 14 the strain was first obtained from a bullock, and was passed in series through a guinea-pig, puppy, goat and, finally, in Experiment No. 6, a full-grown strong bitch, which survived seventy-eight days, and probably would have lived some time longer had it not been accidentally poisoned by a vermicide used to destroy ticks on it. In this case the virulence appeared to be somewhat lowered for dogs; but by the time the strain had been passed through Nos. 13 and 14 the high virulence for dogs was apparently restored again. In Experiments 15 to 20 a fresh strain was used from a large Airedale naturally infected and obtained shortly before its death. This latter strain was used for No. 21 (the horse experiment); by this time it had become highly virulent for dogs, and was apparently quite as virulent for the horse, as the latter was almost dying by the twenty-third day (see Experiment No. 21).

### *Symptoms in Laboratory Animals.*

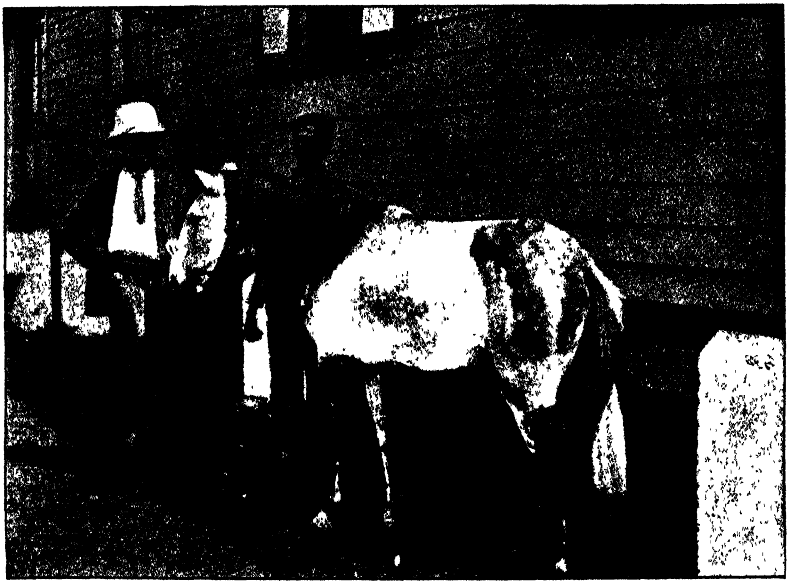
Irregular fever, most marked in dogs, wasting and anæmia were constant symptoms. In dogs, goats, and guinea-pigs a catarrhal sticky discharge from the eyes always heralded the appearance of trypanosomes by a few days; in fact, it was the first obvious symptom, scarcely noticeable, however, in horses or cattle.

Auto-agglutination of the red blood-cells usually appeared at some stage or other of the disease, and often raised the clotting



*Copyright.*] [Photo. by Mr. Lisk Carew, Sierra Leone.

FIG. 1.—Experiment No. 21. Photograph of horse "Sewi" taken on the twenty-third day after inoculation.



*Copyright.*] [Photo. by Mr. Lisk Carew, Sierra Leone.

FIG. 2.—Convalescent. The horse "Sewi" on sixty-fourth day.

rate to such an extent that it became impossible to use pipettes for blood-counts, &c. Citrate of soda overcame the difficulty and at the same time appeared to improve the animal's condition slightly. In the last stages autolysis often occurred. A lipæmic condition of the blood was also occasionally noticed.

### EXPERIMENT No. 21.

*Horse.*—Grey stallion, called "Sewi," aged 12; six years in the Colony—in poor condition. Blood examined repeatedly and centrifuged with negative results.

| | Days | Hæmoglobin | Trypanosomes | |
|---|---|---|---|---|
| 1907<br>Dec. 8 | 1 | Per cent.<br>74 | *Nil* .. | Inoculated subcutaneously with about 2 cc. of citrated blood from laboratory dog No. 20, full of trypanosomes before treatment was commenced on the dog, so as not to induce a methylene blue resistance. |
| ,, | 8 | 68 | ,, .. | Losing flesh. |
| ,, | 14 | 64 | 2 per cover-slip | Trypanosomes first seen. |
| ,, | 15 | — | ,, ,, | *A puppy, subinoculated,* died 22 days after, showing the usual symptoms, but no trypanosomes were found. Horse's temperature now touching 102° F. |
| ,, | 17<br>18 | 56 | 1 per cover-slip | Gradually getting worse. |
| ,, | 20 | 44 | 2 per cover-slip | Intravenous injections commenced, 144 cc. of a 1 per cent. *watery* solution of methylene blue and HgCl (1: 500) (equal parts) in 11 consecutive daily doses. |
| ,, | 21<br>23 | 44 | 3 per cover-slip | Temperature touching 101° F. Very weak, appearing scarcely able to walk, drowsy, somnolent and apathetic, not eating, very wasted, especially the hindquarters, the animal standing with splayed-out hind feet. Coat staring and hair falling out. The horse appeared to be almost dying, and a photograph was taken (see fig. 1) as a record of its condition. |
| 1908<br>Jan. 1 | 25 | 48 | 2 per cover-slip | Hæmoglobin percentage commenced to rise. Slightly better, eating well. Temperature up to 100° F. |
| ,, | 29 | 50 | ,, ,, | Commenced arsenic, 5 grs. daily, by the mouth; total, 60 grs., given in next 12 days. |
| Jan. 6 | 30 | 50 | ,, ,, | Last injection of methylene blue. |
| ,, | 33 | 54 | *Nil* .. | Much stronger, putting on flesh again. |
| ,, | 37<br>38 | 60 | ,, .. | Coat improving, hindquarters filling out. |
| ,, | 40 | — | 1 per cover-slip | Arsenic stopped, full of life, now being ridden to the laboratory. |
| ,, | 42<br>45 | 68 | ,, ,, | Still improving, being given salt. |
| ,, | 49 | 65 | *Nil* .. | The original owner, Chief Alimami Momodu, offers to buy the horse back at an increased price. |
| ,, | 52 | 62 | ,, .. | Salt stopped. |

| | Days | Hæmo-globin | Trypano-somes | |
|---|---|---|---|---|
| Feb. 1 | 56 | 64 | *Nil* .. | Appears to be in splendid condition. |
| ,, | 59 | 64 | ,, .. | *Four puppies subinoculated, two of which were taken home to the R.A.M. College,* and *two left at the laboratory, Sierra Leone.* Horse re-photographed, to show fit condition as a contrast to the other photograph. |
| Feb. 23 | 78 | 60 to 70 | ,, .. | Horse now being ridden and continues to improve in condition and appearance. The two puppies left at Sierra Leone are fit, and show no trypanosomes up to the 19th day after inoculation. |
| Mar. 1 | 85 | — | — | *Two puppies at College* showed no trypanosomes or symptoms after 27 days and were killed, *two rats* being subinoculated from them. |
| ,, | 91 | — | — | Horse ridden from Waterloo to Freetown, 20 miles, on termination of the manœuvres. |
| ,, | 93 | 80 | ,, .. | Horse goes on steadily improving. |
| ,, | 96 | 80 | ,, .. | |
| ,, | 112 | 82 | ,, .. | |
| April 4 | 119 | — | ,, .. | No trypanosomes found after centrifuging a large quantity of blood. |
| ,, | 127 | — | ,, .. | *One puppy* (see 59th day) left at Sierra Leone died, presumably from natural causes. No trace of any trypanosome infection could be found, and the organs are being examined microscopically. The *other puppy* was killed; no trypanosomes found 68 days after subinoculation from the horse. |
| ,, | 142 | — | — | *Two rats at the R.A.M. College* subinoculated from two puppies (see 85th day). *One rat* still alive and healthy; no trypanosomes found after 56 days. The *other rat* died on the 3rd day after subinoculation, from natural causes, no trypanosomes being found. |
| May 1 | 146 | — | ,, .. | Horse ridden daily. |
| ,, 16 | 161 | — | ,, .. | ,, ,, ,, |
| ,, 24 | 169 | 90 | ,, .. | — |

*Post Mortem.*—The most constant feature was a congested condition of the intestines. Occasionally the lymphatic glands were enlarged; the spleen normal or enormously enlarged, the latter being most common in cases naturally infected, where the disease had probably lasted a very long time. An increase of fluid in serous cavities was common. Acute congestion of the kidneys appeared in some cases after using atoxyl. The incubation period and resisting power appeared to vary directly according to the age, size and dosage of the animal. The temperature was no guide to the presence or absence of trypanosomes, but usually fell suddenly before death, and although trypanosomes were found daily in laboratory-inoculated animals, in the natural disease it was often exceedingly difficult to find them at all. Shortly before death, however, in some cases, they were almost as numerous as the red cells themselves. Having found that the hæmoglobin curve gave an extremely accurate comparative index of the course and progress of the disease and the effects of treatment, the more tedious processes of daily blood-counts were omitted.

### *Conclusions.*

It is evident that we are dealing with a trypanosome which is nearly, if not quite, as virulent as *T. brucei* and that this trypanosome is (*sensu stricto*) *T. dimorphon,* although clinically it is strikingly similar to nagana. Favourable results of treatment, therefore, have a positive value.

The difference between the natural disease and that experimentally produced by inoculation is rather one of degree, the type changing from a subacute or chronic to an acute. Probably the form of the disease depends on the dosage of culture given and the manner in which the inoculation is effected. The converse is seen in Experiments 16, 19, and 20, where, under the effects of treatment, the disease is changed from an acute to a subacute or chronic type. In Experiments 15 to 20 the percentage of alcoholic saturated solution of methylene blue used was undoubtedly too weak. Further, owing to the difficulties of intravenous injection in small animals, the drugs were administered subcutaneously and intramuscularly, which was unsatisfactory and in some cases resulted in abscesses. In Experiment 21 (the horse) a 1 per cent. watery solution, which is about ten times stronger than the diluted alcoholic solution, was used. The injections were made intravenously into the jugular vein. Twenty cc. did not appear by any means too large an amount for a single dose. In addition, 5 grains of arsenic were given daily by the mouth. It should be noted that the hæmoglobin percentage began to rise before the arsenic was commenced, and went on steadily rising. In none of the previous experiments was there any attempt at a rise. The photograph gives a most excellent idea of the appearance of the horse, but one might hardly realise that the animal was to all intents and purposes dying, and at that time was so weak that it could be pushed over with the hands. The fact that on the forty-ninth day the original owner, the Chief (Alimami Momodu), offered to buy the horse back at a higher price than that at which he formerly sold it is remarkable. It would be interesting to know what the result would have been on a naturally infected animal, where the amount of infection is so very much smaller, and the disease of a chronic type. Possibly, in addition to a cure being effected, some degree of immunity to this particular strain of trypanosome would have been produced.

I would like to add that I am indebted to the article of Messrs. Moore, Nierenstein, and Todd, "Concerning the Treatment of Experimental Trypanosomiasis," from the Johnston Laboratories of Bio-Chemistry and of Tropical Medicine, University of Liverpool (April 27, 1907), for the suggestion of the idea of trying a mercury salt, in combination with an aniline trypanocide. The arsenic is an addition of my own, based on the classic work of Colonel Sir D. Bruce, C.B., F.R.S., the pioneer of the whole subject, from whom I have received much help, and many kindly suggestions and criticisms.

Before leaving this subject I wish to thank His Excellency the Acting Governor, Haddon Smith, Esq., C.M.G., for his kind assistance in the matter of providing police court messengers and interpreters, &c., to help me in the examination of animals in the Protectorate, without whose assistance very little could have been accomplished. My thanks are also due to Mr. Brooks, the Chief Commissioner of Police, for procuring me a supply of experimental animals.

Serjeants Muirhead and Ogden, R.A.M.C. Laboratory Assistánts, also rendered great assistance, especially the latter, who for nearly twelve months kept daily charts of all the animals, and typed the manuscript for this report.

Finally, to Major Smeaton, R.A., Officer Commanding Mountain Battery (Sierra Leone Royal Artillery), who presented the horse to the laboratory and maintained it at his own expense, my very best thanks are due. I also wish to thank Captain Houghton, R.A.M.C., my successor as Special Sanitary Officer, Sierra Leone, for his reports on the horse, after I had left this Command. The horse is now being brought home to England, where it can still be kept under observation, and it is considered that a complete cure may be fairly claimed at the end of six clear months after the date of the last injection, which will be on July 6th. A free freight has been granted by the Elder-Dempster Steamship Co., owing to the broad-minded liberality of Sir Alfred Jones, K.C.M.G., which is well known in connection with tropical research work at Liverpool.

# REMARKS ON THE STUDY OF BITING FLIES, WITH SPECIAL REFERENCE TO THE GENUS *GLOSSINA*.[1]

By Captains A. E. HAMERTON, D.S.O., and H. R. BATEMAN.
*Royal Army Medical Corps.*

SINCE the literature on the above subject is for the most part inaccessible to medical officers on foreign service, an introduction to the practical study of the life-history and general anatomy of flies concerned in the dissemination of trypanosome diseases may be of use.

The tsetse-fly, *Glossina palpalis*, will be taken as a type to illustrate the nature of the genus, and the technique employed.

## METHODS OF STUDY.

For methods of catching, keeping, breeding, and feeding flies, the reader is referred to the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. i., January, 1904, article on "Surra," by Colonel Bruce, C.B., F.R.S.

Flies, when required for dissection, may readily be killed by transferring them to a bottle containing a little cotton-wool soaked in chloroform.

If the intestinal tract only, of a series of flies, is to be examined for parasites, careful dissection of each fly is impracticable and unnecessary. All that is required is to snip off the terminal segment of the abdomen with a fine pair of scissors, then to lay the body of the fly flat upon an ordinary slide in a drop of normal saline + ½ per cent. sodium citrate. A mounted needle is next pressed flat down on the waist, or base of the abdomen, and passed along with an even steady pressure towards the tip of the abdomen, so as to squeeze out all the contents on to the slide. In this manner nearly the whole of the alimentary tract can be got out intact, and the various abdominal organs may readily be separated. It is necessary to mash up the stomach blood with salt citrate solution before making smears. The lower intestine may be smeared on clean dry slides [1]. If the gut contains living trypanosomes in large numbers, the fact will be obvious even with the $\frac{1}{6}$-inch objective, for their extremely energetic movements are readily recognisable through the intestinal walls.

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[1] We are indebted to Mr. Robert Newstead, F.L.S., of the Liverpool School of Tropical Medicine, for the loan of the blocks illustrating this article.

The several portions of the gut to be examined have to be isolated and smeared on a clean slide. As regards staining, Leishman's stain, as usually employed, is sufficient for diagnostic purposes, but results are not good when precise morphological details are required. The chromatin of the trypanosomes contained within the fly does not stain readily by the ordinary method. It is better to proceed as follows :—

(1) Fix the film, whilst wet, in osmic acid vapour by exposing for forty-five seconds to osmic acid 4 per cent. in distilled water plus one drop glacial acetic acid. Films on cover-slips may be exposed to the vapour at the bottle mouth. Films on slides are best exposed to the vapour by inserting the slide into a convenient-sized wide-mouthed bottle containing a few drops of the osmic acid solution.

(2) Spread over the film a little fresh blood serum and allow it to remain on for two or three minutes.

(3) Gently rinse off the serum with distilled water.

(4) Mix two parts of Leishman's stain with three parts distilled water in a watch-glass. When thoroughly mixed, cover the film with the stain, and allow it to act for one to one and a half hours.

(5) Wash in distilled water.

(6) Decolorise and differentiate by rinsing rapidly first with 1 in 1,500 acetic acid (to remove excess of blue) and then with 1 in 7,000 solution of KOH (to remove excess of eosin).

(7) Wash in distilled water, drain, and blot off excess of water.

To obtain the most perfect and natural results for study of the structure of blood parasites, the following procedure is necessary :—

(1) Never allow the films to dry after spreading, but put at once into osmic acid vapour for forty-five seconds.

(2) Transfer to absolute alcohol for two to three minutes.

(3) Pass through 80 per cent., 60 per cent., 40 per cent., 20 per cent., and 10 per cent. alcohols in distilled water.

(4) Mix Giemsa stain as follows: twenty-five drops of stock stain (Grubler's) to 25 cc. distilled water. Leave the films, face downwards, in the staining fluid for eight to twelve hours.

(5) After staining wash in distilled water, and rinse quickly in solution of orange tannin (orange G. 1 per cent, tannin 5 per cent. in distilled water).

(6) After rinsing in orange tannin, wash in distilled water.

(7) Dehydrate by rapidly passing through acetone, transferring to xylol, and mounting in Canada balsam.

The preparation can be dehydrated by quickly flushing with absolute alcohol, followed by xylol bath. Films made on thin cover-slips,

⅝ inch square, are most convenient for this method, as they readily float film downward in the reagents used.

Professor Minchin has recently shown one of us a very rapid method of examining material for trypanosomes:—

> "Ring a slide with vaseline. In the centre of the ring put a minute drop of methyl green stain: methyl green 0·25 per cent., acetic acid 1 per cent. in distilled water. Spread a film of the material under examination on a cover-glass, and expose whilst wet to osmic acid vapour for forty-five seconds. This fixes and kills the trypanosome without letting the film dry. Lower the cover-glass on to the drop of stain within the ring on the slide, and gently press down on the vaseline."

In this way the parasite can be beautifully seen in its natural unshrunken condition. The organism absorbs the stain, and after a little time its structure becomes well differentiated. The preparations will keep several days if ringed with paraffin.

## DISSECTION OF THE FLY.

### *Apparatus required.*

(1) Some form of dissecting microscope. (An ordinary microscope with the lower lens of the ⅔ objective removed can be utilised, but it is difficult, and the worker has to accustom himself to the position of the object being reversed.)

(2) A fine pair of scissors.

(3) Several needles, mounted in wooden handles—penholders answer well.

(4) A Petrié dish or similar shallow vessel.

(5) Paraffin (bacteriological or candle paraffin).

(6) A fine-pointed pair of forceps.

Enough paraffin should be put into the dish and melted, so that it forms an even layer ⅛ inch thick at the bottom of the dish. Several flies, minus wings and legs, are floated on the melted paraffin, ventral or dorsal aspect uppermost, as required. If the paraffin solidifies quickly, a piece of heated wire may be used to melt a pool of paraffin large enough to float the fly. The solidification of the paraffin fixes the fly in the position for dissection.

Fifty per cent. alcohol in water should now be poured into the dish until the flies are completely covered. If the tissues of the insect are required for histology, the fly should be dissected in the fixing fluid instead of in alcohol. A good fixing fluid is made thus:

| | |
|---|---|
| Picric acid saturated solution ... ... ... | 100 cc. |
| Acetic acid ... ... ... ... ... | 1 cc. |

In the fluid, the thorax and abdomen of the fly are opened, the thorax simply by splitting the chitin of the dorsum by means of a mounted needle, and removing the dorsal integuments. The greater part of the thorax is a mass of muscles superficially situated. These muscles must be removed in order to display the other organs in the thorax. The abdomen is dissected by carefully tearing through with a needle the integumental membrane between the second and third abdominal segments. The abdominal segments are readily removed, care being taken not to injure superficially situated organs, such as the heart and the salivary glands.

Before entering on the descriptive anatomy of the alimentary tract, a brief notice will be taken of the superficial structures as they are viewed on first laying open the thoracic and abdominal cavities. It will be assumed that the superficial thoracic muscles have been removed.

## RESPIRATORY SYSTEM.

The tracheæ are readily recognised as brownish-coloured arborescent tubes traversing laterally the abdominal cavity. These lateral branches arise from two longitudinal trunks situated in the angle formed by the junction of the ventral and dorsal abdominal terga. Of these transverse ramifications, some anastomose with those of the opposite side, others communicate with external openings termed spiracles. All perfect insects breathe by means of a similar tracheal system—respiring air through numerous spiracles opening on the surface of the thorax and abdomen.

## CIRCULATORY SYSTEM.

The heart is seen occupying the five anterior segments of the abdomen. It is situated dorsally immediately below the terga, and lying above the first part of the abdominal intestine. It is embedded in the fat body (loose, fatty tissue enveloping the abdominal organs), and requires careful dissection. Anteriorly, the lumen of the heart narrows to form a thin-walled vessel, which passes through the waist to become the artery, termed by Professor Minchin the thoracic aorta. This vessel can be followed through the thorax as far as the œsophagus, lying always superficial to the digestive tract [2].

It will be remembered that insects have no distinct continuous body cavity in which the viscera lie, corresponding to the pleuroperitoneum of a vertebrate. All the organs are connected together by delicate sustentacular tissue formed of branching cells, in the meshes of which the blood circulates. Insects have no system of arteries, capillaries, or veins. The circulation is maintained by rhythmical pulsation of the abdominal dorsal vessel (heart).

The blood is propelled by the heart to the head, where it is poured into numerous sinuses between the various organs, and returns by the ventral sinus to the abdomen. After bathing and nourishing the various organs of the body, it passes again into the ventricular portion of the dorsal vessel. The blood of insects is thus equivalent to the lymph of vertebrates, which it closely resembles in physical and microscopic characters [4].

We are not aware that trypanosomes have ever been found in the blood of glossinæ. This is an interesting point to clear up. A sample of blood may be obtained by inserting a fine point of a capillary tube alongside the dorsal vessel, *i.e.*, in the pericardial sinus. The minute quantity so extracted may be spread out as a film on a slide, stained and examined.

## ALIMENTARY SYSTEM.

We cannot commence a description of the alimentary system of *G. palpalis* better than by appending Professor Minchin's concise description of the salivary glands of the insect, given in his Report on the Anatomy of the Tsetse-fly (*Proceedings of the Royal Society*, series B, vol. lxxvii.) :—

> "The salivary glands in *G. palpalis* occupy a very superficial dorsal position in the abdomen on each side of the heart. They consist of two long tubes, much coiled and embedded in the fat body. Very transparent in the fresh condition, they become glistening white when put in alcohol. With many twists and turns the tubes run forward to the waist, and then, rapidly diminishing in calibre, pass into the thorax, descending towards its ventral aspect.
>
> "On entering the thorax, the salivary gland becomes the salivary duct. The two ducts run a parallel course through the thorax on a level with the duct of the sucking stomach or crop, and on each side of it. Passing forwards, they run under the proventriculus and above the thoracic ganglion.
>
> "When they reach the neck, the salivary ducts become so fine that their course is most difficult to trace. They pass under the brain, then under the pharynx, where they unite to form a common duct which enters the hypopharynx in the bulb of the labium."

It must be remembered that, although in *Glossina* the salivary glands are abdominal, in most diptera they are thoracic organs. In *Stomoxys* they are partly abdominal, partly thoracic.

Stuhlmann and Minchin tell us that they have never found trypanosomes or development stages of trypanosomes in the salivary glands of infected glossinæ [5]. Koch, on the other hand, has recently described trypanosomes as occurring in the salivary glands of infected flies [6].

The exact function of the salivary glands is not accurately known. The teased-out cells have no action on starch, and no definite reaction to litmus paper. The saliva causes the irritation set up by the bites of these flies, and probably prevents the coagulation of ingested blood. Professor Minchin [7] has pointed out that if the teased-out glands be stained with picro-carmine, many circular corpuscles 9—15 $\mu$ in size, with a deeply staining nucleus, may be seen in the gland contents. These bodies are present in every gland examined and have no connection with parasites.

Slightly posterior, and internal to the salivary glands—lying between them and the heart, on the dorsal surface—are seen the thickened terminations of two of the Malpighian tubules. They are often very distinct in female flies, and distended with a white substance said to be uric acid. In addition to the two terminals noted there are two other Malpighian tubules. The four Malpighian tubules surround the gut as it were with a spider's web, distributing themselves throughout the whole abdomen, and so entangled with the fat body that it is quite impossible to unravel them. It is better to trace them from their commencement at the junction of the proctodeum with the hind gut, where they arise as two main stems, one from each side of the gut. These soon branch into two fine tubules; the four tubules thus formed being elaborately coiled and entangled in their ramifications throughout the abdominal cavity.

It is stated that the Malpighian tubules are excretory organs, viz., the kidneys of insects. Lowne [4], in his book on the blowfly, maintains that the Malpighian tubules in insects are digestive (hepatic) organs, and that the finding of uric acid crystals in them does not prove their renal function, since the livers of mammals contain large quantities of urea, and uric acid is abundant in the livers of birds. Although trypanosomes occur in the mouth-parts of *G. palpalis* for some forty-eight hours after the insect has sucked the blood of an infected animal, it is in the alimentary canal, beyond the œsophagus, that the parasites apparently undergo multiplication, and, perhaps, some cycle of development [3], [6], [7]. The alimentary tract of *G. palpalis* has been elaborately described by Minchin, Stuhlmann, Giles and others [2], [4], [8]. We would especially refer the reader to the late Lieutenant F. M. J. Tulloch's excellent paper on the Internal Anatomy of *Stomoxys*, which appeared in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS for August, 1906. The drawings illustrating the above article will enable the reader to follow the descriptions here given.

The œsophagus in *G. palpalis* commences at the posterior extremity of the chitinous pharynx or fulcrum, and runs first in an upward direction. It then bends abruptly backwards, and, entering the ventral aspect of the brain, passes through its substance to emerge on its dorsal surface in the median line. At the bend the œsophagus rapidly diminishes in calibre, becoming so slender in passing through the brain that it is a difficult matter to expose it intact. On issuing from the brain it passes direct to the occipital foramen or neck, through which it passes, lying dorsal to the large nerve-cords connecting the brain with the great thoracic ganglion. Having traversed the brain, it widens out again gradually, as it passes into the thorax to join the centre of the ventral aspect of the proventriculus.

Contiguous to the entrance of the œsophagus into the proventriculus, the duct of the crop emerges, also from the ventral aspect, and in such a manner that it may be taken as though the œsophagus, after communicating with the proventriculus, is continued along the thorax, passing through the waist, or narrow aperture joining the thorax to the abdomen, to be expanded into the large thin-walled crop, or sucking stomach, which occupies the anterior portion of the abdominal cavity. The proventriculus is a peculiar muscular organ of somewhat oblong shape, with its lateral edges curled inwards ventrally, so as to embrace the termination of the œsophagus and the origin of the duct of the crop. It lies ventral to the powerful wing muscles and the aorta, *but* dorsal to the great thoracic ganglion. It marks the commencement of the fore-gut or thoracic intestine, which, arising from the middle of the dorsal aspect of the proventriculus, runs backwards through the thorax, as a straight tube of even calibre, until it passes the waist.

The function of the proventriculus is said to be chiefly that of a valve, by which the flow of ingested blood is directed into the gut, or into the crop, as required. Some entomologists maintain that this organ is analogous to the gizzard of birds. From its position and structure it probably functions as a valve, a gizzard, and a glandular organ all combined [4]. The crop (misnamed sucking stomach) is a large thin-walled sac occupying the ventral aspect of the abdominal cavity anteriorly. Shortly after feeding, this structure is filled with blood, and occupies over a third of the capacity of the abdominal cavity. At other times it is distended with gas which is contained within a distinct membranous bag, blown up within the cavity of the crop, forming as it were one bag inside another. The crop has nothing whatever to do with sucking. It is merely a reservoir for the storage of blood.

We now come to consider that part of the alimentary canal with which we are most concerned in following up the chain of events affecting the career of ingested parasites. Before continuing with the descriptive anatomy, a brief summary of Schaudinn's opinion on the fate of *Trypanosoma noctuæ* and *T. ziemanni* ingested by blood-sucking flies along with their food may be of interest [9]:—

"Schaudinn stated that *T. noctuæ* of the little owl, on being taken into the alimentary canal of the gnat *Culex pipiens*, and after a period of multiplication lasting two to six days, entered upon a resting phase, and was found either between the epithelial cells of the stomach or attached to them after the manner of gregarines. The parasites remained in this resting phase until they were aroused to a second period of reproduction by the stimulus of a fresh supply of blood when the insect fed again. Eventually they passed along the intestine until they came to the junction of the ileum and colon, where, finding nutriment scarce, and possibly the surroundings uncongenial, they penetrated the thin walls of the gut, passing through it into the vascular sinuses around, whence they were carried to the heart. From the heart the trypanosomes were carried along the aorta to the large vascular sinuses surrounding the pharynx. Here they came to 'rest,' and multiplied again to such an extent that they forced their way through the walls of the pharynx, being then in a position to escape into the blood of the next owl bitten by the gnat. It would appear from Schaudinn's work that the different trypanosomes experimented with chose different organs of the insect host as a refuge for themselves during their resting phases and periods of multiplication. For example, *T. ziemanni* is said to rest and multiply in the secretory epithelium of the salivary glands of its insect host.

"Both *T. noctuæ* and *T. ziemanni* may be inherited by gnats in the following manner:—

"After breaking through the wall of the intestinal canal, instead of permitting themselves to be drifted by the circulatory fluids, they pass to the ovarian follicles. Thence they penetrate into the ova, and there assume a gregariniform resting condition, in which they remain throughout the development of the embryo, thereby causing a true hereditary infection.

"Further experiments in this fascinating field of research are needed, since more recent workers have cast doubt on Schaudinn's experiments and conclusions."

Minchin [3], Gray and Tulloch, when working in Uganda, pointed out that from 1 to 7 per cent. of tsetse-flies are the hosts of trypanosomes which are natural to them, although these flies may never have fed on blood. Two of these forms of trypanosomes have been described under the names of *T. grayii* and *T. tullochi.* It is said that they can be distinguished from *T. gambiense*, as follows: By their greater length and slender eel-like shape, and by their greater activity. Further, Christophers and Stephens [10] tell us that if a little fresh goat's serum be added to the parasites, they will become immobile if they are fly trypanosomes, whereas *T. gambiense* will be uninfluenced.

Tsetse-flies, besides harbouring *Trypanosoma*, often have other parasitic protozoa within their intestinal tract. A form of myxosporidia known as *Myxosporidia leibergi* is described by Dutton and Todd [11] as existing in the intestine of *G. palpalis* as a non-motile rod 7 μ in length, 1 μ in width, with abruptly rounded ends. Its body-substance consists of pale blue protoplasm in which occur chromatophilic granules and clear rounded areas. Cysts containing these parasites were seen attached to, or actually within, the wall of the intestine.

To return to the study of the anatomy of *Glossina*. The intestine is best studied in fully-gorged insects, which have been hardened in weak alcohol. For purposes of description Stuhlmann's [5] plan of dividing the intestine up into Fore-gut, Mid-gut, Hind-gut, End-gut, and Anal Ampulla will be followed.

(1) The Fore-gut. This includes the thoracic part of the intestine, which may be traced backwards from its origin at the proventriculus to its entry into the abdomen. On entering the latter cavity the gut becomes very distensible, and is situated dorsally, but with the heart intervening between it and the terga of the abdominal wall.

(2) The Mid-gut extends from the first bend of the intestine to the commencement of the last loop above the entrance of the Malpighian tubules. It is in the mid-gut of the tsetse-fly that trypanosomes are to be found up to ninety-six hours after feeding in the case of *G. palpalis* [3]. The ingested blood is here of a greenish-black colour, and is enclosed, like the contents of a sausage, in the bowel, within a delicate hyaline structureless membrane known as the peritrophic membrane. Between this peritrophic

membrane and the epithelium, there is only serous liquid or mucus. It is in this fluid that trypanosomes are especially to be found.

(3) The Hind-gut is the direct continuation of the mid-gut, and consists of the last loop of the intestine, above the entrance of the Malpighian tubules. No blood corpuscles can be recognised in the hind-gut, the bowel contents consisting of a serum-like fluid in the starving fly, or a brownish sticky mass in flies which have recently fed. Trypanosomes may be found in this part of the bowel—especially *T. grayii* and *T. tullochii*, which are described as causing a peculiar and distinct trypanosomiasis of *G. palpalis*.

(4) The End-gut (ileum and colon of Minchin) is that part of the intestine which extends from the entrance of the Malpighian tubules to the heart-shaped dilatation known as the anal ampulla (rectum of Minchin). The end-gut continues to undergo peristaltic contractions for a long time after it is dissected out in normal saline; it is thus readily distinguishable from the rest of the intestine.

(5) The Anal Ampulla, or rectum, is a widely-dilated portion of the alimentary canal; thin and transparent in texture and attached to the body-wall by its dilator muscles.

Projecting into the lumen of the rectum are four hollow white-looking processes of epithelial structure. They are described as rectal glands by Minchin [2], but their function is unknown.

The anus is connected with the rectal ampulla by a short, narrow, muscular tube, which opens in females at the posterior extremity of the abdomen, immediately dorsal to the genital aperture. In males the outlet lies in the vulviform median groove of the hypopygium, an external appendage to the male generative organs.

## REPRODUCTIVE SYSTEM.

Before describing the genital organs, it may be noted that the sexes in *Glossina* may be readily distinguished, since in the male the external genitalia form a conspicuous knob-like protuberance named the hypopygium, situated beneath the end of the abdomen [12].

The genital organs in both sexes lie close to the ventral aspect of the body in the hinder segments of the abdomen. In order to expose them, it is necessary to carefully unravel and remove the abdominal intestine as far as the rectum. The male organs of *G. palpalis*, situated one on each side of the median line, consist of testes with their ducts, the vesiculæ seminales, and a common ejaculatory duct.

The testes are a pair of spherical lightish-brown bodies, which on close examination are seen each to consist of a tube tightly coiled up into a ball at its free end. By careful dissection this tube may be unravelled, when it may be seen to commence as a delicate white filament embedded in the fat body, forming a sort of tail, or appendix to the coiled-up pigmented tube of the testis.

The coils of each testis are continued as a comparatively straight duct of very fine calibre, *i.e.*, the vas deferens. The vasa deferentia converge to open into a dilatation, the ductus ejaculatorius. The vesiculæ seminales are seen lying between the testes, as two white tubes commencing with a blind end which presently becomes thickened, and more or less elaborately coiled to terminate in two slightly sinuous tubes opening into the ductus ejaculatorius between the openings of the vasa deferentia. The ductus ejaculatorius, after turning backwards and forwards, loops round the rectum to enter the penis on its right side.

The external generative organs are concealed beneath the hypopygium. The penis is an organ of complicated structure and mechanism, with an armament of hooks, spines and erectile flaps.

The internal generative organs of the female *G. palpalis* consist of a pair of ovaries; a pair of receptacula seminis, with their ducts; the uterine glands, a mass of intricately convoluted branching tubules situated on either side of the uterus, into which they open by a common duct; an oviduct, a uterus, and a vagina. In many flies the ovaries consist of sixty or more ovarioles, or egg tubes, connected together by delicate membranous septa (*vide* the late Lieutenant F. M. J. Tulloch's paper on the Internal Anatomy of *Stomoxys*, JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, August, 1906).

In *G. palpalis* the ovaries are reduced to a single pair of egg-tubes, one on each side of the body. Each egg-tube is divided by constrictions into four or five egg-chambers. The ova in these chambers may be seen in various early stages of development. Only one of these ova, that which occupies the lowest chamber nearest the oviduct, is matured. Two ova are never matured simultaneously in the ovarioles or egg-tubes, but each ovariole produces a full-grown egg alternately. The two ovaries are therefore always asymmetrical, the one containing a matured egg appearing as a conspicuous white sausage-shaped body, while the other may be so small as to be recognised with difficulty. The two ovarioles coalesce like unequal limbs of a lopsided Y, to form a short broad tube, the oviduct, which at its lower end expands to open into the dorsal aspect of the uterus, a little below the head end of the latter.

The receptacula seminis are two conspicuous little globules, of a bright orange-yellow colour, due to their chitinous walls. They are surrounded by a delicate transparent envelope of epithelial cells. If they be excised and teased out on a slide they will be found to be well stored with spermatozoa.

Although insects have the sexes distinct, it is believed that the sperm is transferred from the male to the receptacula seminis by a single coitus. The receptacula, thus replenished, are said to be stocked for days, months, or even years. Fertilisation is effected as the ovum passes through the oviduct, so that the real act of fertilisation is not effected by coition of the sexes [14].

The two receptacula seminis are firmly attached to each other. A slender duct comes off from each to open separately into the dilated termination of the oviduct. Immediately below the opening of the oviduct into the uterus, the common duct of the tubular uterine glands enters the latter by a median dorsal aperture.

The uterus differs considerably in appearance according to the size of the larva which it is generally found to contain. In the gravid state it is a transparent sac attached to the body-wall by a number of muscles. The contained larva shows as a conspicuous white object. When it reaches a certain size, the rings of its segments are plainly visible through the transparent wall of the uterus. The uterus opens into a short broad vagina, which is connected to the body-wall by two sets of dilator muscles. The vagina widens out as it approaches the vulva, which is a crescentic transversely elongated aperture separated from the anus by a chitinous partition.

## THE MOUTH-PARTS OF *Glossina palpalis*.

The fact that certain species of tsetse-fly constantly carry trypanosome infections, whilst other closely-allied species of blood-sucking flies living in the same area seem to be unable to convey these diseases experimentally, lends additional interest to the study of the suctorial apparatus of these insects. Koch, by pressing the bulb at the base of the tsetse-flies' proboscis, was able to obtain a clear fluid in which he frequently found trypanosomes. In this fluid trypanosomes must be introduced into the victims of the flies.

If a fly be caught after having fed on an infected animal, it often regurgitates a drop of blood full of parasites similar to those ingested.

Since trypanosomes have been proved to live apparently unaltered in the flies' stomach for forty-eight hours [3] [7], such a regurgitation taking place during feeding time would be a possible means of transmission of the parasite.

The external mouth-parts in *Glossina palpalis* do not differ in the two sexes. If the heads of a few specimens be cut off and steeped in a warm 10 per cent. solution of KOH for a few hours, the chitin will be cleared and softened, and so the study of the parts facilitated.

The external mouth-parts are seen to consist of two maxillary palpi (*a*, *b*) projecting horizontally forwards. When the proboscis is out of action it is ensheathed within the deep longitudinal groove which runs along the inner aspect of each palpus.

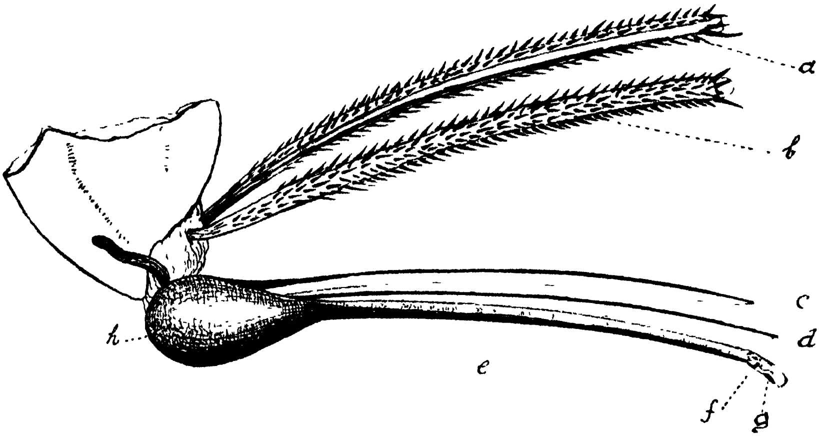

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**Fig. 1.**—General View of Proboscis seen in Profile, × 25. *a* and *b*, palpi; *c*, labrum; *d*, hypopharynx; *e*, labium; *f*, bifurcated plate on labella; *g*, dark ventral chitinous area of labella: *h*, the bulb.

The proboscis during feeding is thrust vertically into the skin at right angles to the palpi. It consists of three parts: the upper lip or labrum (*c*); the hypopharynx (*d*); the lower lip or labium (*e*). If the head of the fly be examined from below, it will be seen that the proboscis is attached to the head by a delicate membrane which permits of a considerable range of movement on the part of the piercing weapon. This soft flexible membranous attachment of the proboscis to the head is called the head-cone. This head-cone is capable of protrusion and retraction by the muscles connecting the base of the external mouth-parts with the pharynx and the chitinous plates surrounding the occipital foramen. It not only permits of free play for the movements of the proboscis, but also plays an important part in the mechanism of suction. The removal of this membrane exposes the floor of the pharynx, which is crossed by the nerves to the proboscis, a pair of retractor muscles uniting anteriorly, and the two delicate salivary ducts which unite to form one extremely fine tube passing forwards into the hypopharynx. The elements of the proboscis will now be considered separately.

The labium or lower lip forms the greater part of the proboscis. It is a double-walled chitinous gutter or channel, expanding at the head end or base into a chitinous bulb. The cavity of the bulb is mainly occupied by the attachments of the muscle bundles of the two powerful laterally placed muscle cords which traverse the labium to its extremity, to be attached to the plates bearing the teeth files and rasps of chitin with which the insect pierces the skin of its victim.

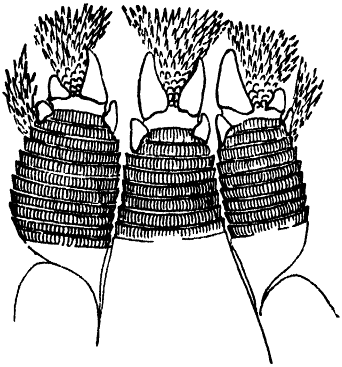

FIG. 2.—*Glossina palpalis.* Inner aspect of inner wall of labellum, showing cutting apparatus; this is everted during the act of biting.

The distal extremity of the labium is somewhat swollen and rounded off at the tip, and known as the labella (*g*), in which lies the boring mechanism of the proboscis. Sometimes by pressure on the bulb at the base of the labium the labella may be made to gape a little. This is especially the case with *Stomoxys*, which genus possesses a large movable labellum, readily recognised as consisting of two flaps, which move outwards on a horizontal plane, like the blades of a pair of urethral forceps. The labellum is, with the exception of a few sensory hairs, smooth on its outer surface.

Over the inner surface play the chitinous plates, on which are arranged a curious armament of teeth, files or rasps, and fan-like expansions covered with spines, with which the insect bores a hole through the skin of the animal from which it draws blood. While biting the labellum is slightly everted, so as to embrace the minute portion of skin to be operated upon by the cutting appliances on its inner surface.

The labrum is a trifle shorter than the labium, the point of the former lying in the fork of the labellum. The labrum requires separating from the labium by careful teasing with a fine needle.

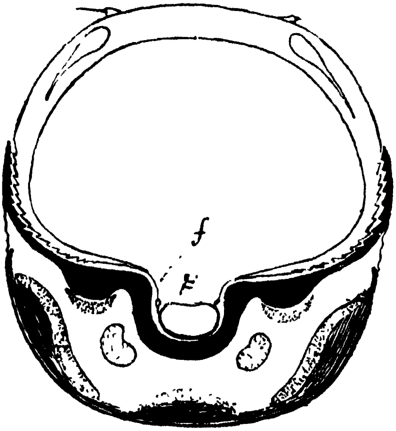

FIG. 3.—*Glossina palpalis.* Transverse section of the proboscis just in front of the bulb. *e*, Hypopharynx; *f*, the membranous portion of the labrum, which is closely applied to the "horns" of the hypopharynx. Above *f* are seen the interlocking teeth of the labrum and labium. (After Stephen and Newstead.)

When thus examined with a low power, it bears a superficial resemblance to the needle of a hypodermic syringe. If it be examined closely or in transverse section, it is seen to be like the labium, a closed chitinous gutter or channel with its concavity downwards. The outer sides of this gutter are fitted with rows of teeth, which fit into corresponding notches on the inner aspect of the sides of the gutter formed by the labium. The concavities of these two structures, thus locked in apposition, go to form the complete circle of the tube of the proboscis.

The hypopharynx is an exceedingly slender cylindrical tube, the excretory duct of the thoracic salivary glands, by means of which their secretion is carried almost to the tip of the proboscis. This structure is difficult to separate, and is so fine that it is not easy to see except in transverse section of the whole proboscis It is then seen to lie in a groove in the floor of the labium, and to be fixed in its bed by a fine membranous expansion from the incurved edges of the labrum. The hypopharynx joins with the labium near the base of the latter. A short distance proximal to the junction of the hypopharynx with the labium, the latter unites with the labrum. This spot, where the external mouth apparatus is attached to the head, is regarded as the actual oral aperture of the fly.

## THE INTERNAL MOUTH-PARTS.

From the tube constituted by the external mouth-parts, the blood is conducted into the pharynx, a large obliquely triangular organ occupying almost half the cavity of the head. This is the apparatus by which the blood is sucked up through the proboscis after puncture of the victim. The pharynx is really a part of the œsophagus which has become chitinised, and expanded to form a pumping engine. The circular lumen becomes widened out into a transverse slit with anterior and posterior walls of chitin, the lateral margins of which are produced into broad wings or flanges, which turn forwards to blend anteriorly with the firm chitinous wall of the insect's face. The large space thus formed between the face of the insect, the anterior of the two posterior walls of the cavity enclosing the lumen of the alimentary canal, and its lateral expansions, is filled with powerful muscles. It is supposed that by the contraction of the lower fibres of these muscles the anterior elastic plate of the posterior wall is pulled forward, so that the lumen of this part of the alimentary canal is enlarged, causing a space void of air, into which blood is sucked from the tube formed by the external mouth-parts.

Simultaneously with the relaxation of the lower muscle bundles, and the recoil of the elastic plate obliterating the lumen, the muscle bundles lying immediately above contract, enlarging the upper part of the lumen into which the blood flows, to be forced on into the œsophagus when these upper muscle fibres relax, thus permitting the falling back of the anterior elastic plate.

This successive contraction and relaxation of the complicated muscular system of the pumping engine is merely a supposition attempting to explain the mechanism of suction from the study of dissections of the dead parts. It is obviously impossible to verify such an inference by observation on the living fly.[1]

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[1] For further information on the mouth-parts we would refer the reader to [4], [13], [14].

In concluding this outline of some anatomical features of the tsetse-fly, we desire to express our deep gratitude to Dr. C. J. Martin, F.R.S., of the Lister Institute, and to Professor E. A. Minchin, M.A., F.Z.S., of London University, who has assisted us, in placing his laboratory, appliances, and material at our disposal, and in giving us the benefit of his special experience in this kind of work.

## METHOD OF PRODUCTION.

The genus *Glossina* differs from the majority of other genera of the family *Muscidæ* in being viviparous. In this it closely resembles the pupipara [15], a group of bird and mammal parasitic flies. The pregnant female glossina produces at frequent intervals a single full-grown larva, which is at birth yellow in colour and [16] nearly as large as the abdomen of the mother. This larva is furnished with a black hood at one pole and two minute spikes at the other. The pupa is composed of twelve segments and is annulated [16]. Immediately on being born the larva creeps about with a good deal of activity, evidently searching for some cover or hole in which to hide. Having found a resting-place, it immediately begins to change colour, and after a few hours has turned into a jet-black hard pupa or nympha. If these pupal cases are put in a perfectly dry place, as in a wooden box, the perfect insect hatches out in about six weeks.

Dr. A. D. Bagshawe has (August, 1906) discovered the natural breeding-grounds of *G. palpalis.* He states [17] "the larvæ are dropped in shade, it may be of shrubs, it may be of bananas, within 45 yards of water, on banks with a decided slope, where the surface soil is loose and friable and partly composed of vegetable *débris.* The slope seems essential." He adds that the larvæ were difficult to find, and were not numerous in any one spot.

The mode of reproduction detailed above has an interesting bearing on the life economy of the insect. In the case of the blow-fly and most diptera, the female, after a single fecundation, lays her batches of eggs in selected places and then, when her oviducts are emptied, dies. The glossinæ, however, are capable of repeated fecundations and distribute their larvæ in rapid succession over comparatively wide areas. The practical importance of this is obvious, as it renders any attempt to reduce the number of flies, by attacking their larvæ, absolutely hopeless.

## GENERAL CHARACTERISTICS OF THE GENUS *Glossina.*

The following description of the tsetse-flies in simple language is given by Austen [18]:—

"Tsetse may be described as ordinary-looking sombre brownish or greyish-brown flies, varying in length from 3½ to 4⅔ lines in the case of *G. morsitans* to about 5½ lines in that of *G. fusca* or *G. longipennis*, with a prominent proboscis in all species. The hinder half of the body or abdomen in the best known species, though not in all, is of a paler colour and marked by sharply defined dark brown bands, which are interrupted on the middle line; the abdomen, however, is invisible when the insect is at rest, as it is then concealed by the wings. The sexes of tsetse-flies can readily be distinguished, since in the male the external genitalia form a conspicuous knob-like protuberance (hypopygium) beneath the end of the abdomen, which is absent in the female . . . . In the resting position their identification is easy. In this attitude they (the tsetse) can be distinguished from all other diptera, especially from those belonging to the genera *Stomoxys* and *Hæmatopota*, which are most likely to be mistaken for them, by the fact that the brownish *wings lie closed flat over one another down the back* like the blades of a pair of scissors, while *the proboscis projects horizontally in front of the head.*"

The fly thus has "an elongated appearance," as Colonel Bruce has pointed out [19].

As regards its length, the tsetse-fly is, roughly speaking, twice the size of the stomoxys, and one-third as large again as the hæmatopota.

*Habitat of the Genus* Glossina.—Austen states [20] that as a general rule "the tsetse is confined to damp, hot, low-lying localities, either on the borders of rivers or lakes, or at any rate not far from water. Cover in the shape of more or less thick bush or forest is essential, and the fly is not found on open grassy plains." "Roughly speaking. . . . it is absent from any district that is above 3,000 feet in altitude [21]."

As is well known, the glossina is confined to more or less definite areas known as "fly belts," "fly areas," or "the fly," Austen attributes this localisation to three factors: (1) the physical character of the locality; (2) the dependence of the fly on the blood of wild animals; (3) the social tendency exhibited by the majority of diptera, whereby individuals of the same species collect together in close proximity in special places, although without exhibiting anything in the shape of mutual aid [22].

The habitat of *G. palpalis* has been carefully worked out in the Uganda Protectorate. The conclusions of the work done on this point may be summarised briefly as follows :—

The essentials of a "fly area" are (1) "open" running water, *i e.*, running water free from sudd, close reeds, or dense water-weeds; (2) well-defined banks, preferably sloping in the neighbourhood of such water; (3) overhanging shade, "preferably of scrub," above these banks [23].

Hodges states that "the presence of ambatch bushes at the true shore or in the water near it . . . always means the existence (in Uganda) of a little comparatively open water, and is thus favourable to the fly, though by no means an invariable sign of its presence."

The *G. palpalis* is not present in open grassy spaces, nor at the edges of forest, if the latter are separated from water by a distance of only 20 to 30 yards [24].

*Habits of* Glossina palpalis.—Like other, of its species, the *G. palpalis* is a voracious feeder on all vertebrate blood. Preferring naked skin, the fly will, however, bite through clothing. Their flight is direct, and when on the wing the wings make a buzzing sound, but so lightly do they descend on their victim that the sharp prick of their proboscis is often the first warning of their arrival. Though shade appears to be essential to the fly, the *G. palpalis* is most active between the hours of 8 a.m. and 4.30 p.m. in Uganda [25]. In the Bahr-el-Ghazal Province to the north, Captain Ensor, R.A.M.C., states that this fly is most active from about sunrise to 10 a.m. and from 4 p.m. till about sunset, and orders have been issued to the natives that water is to be drawn only between 10 a.m. and 4 p.m., and the river banks are to be avoided during the fly's hours. Thus it would appear that in the Bahr-el-Ghazal Province the *G. palpalis* has adopted the feeding hours of the *G. morsitans*. In other respects, its habits would appear to coincide with the fly in Uganda. During no period of the day, however, is one safe from their bite, as when numerous, and when the food supply is somewhat deficient, the fly feeds at any hour [26]. During rain and high wind it retires almost completely. Both the male and female feed on vertebrate blood. Bagshawe thinks that where human blood is obtainable the female fly predominates, and that females wander further in search of food than do the males [27]. By a series of clever experiments he showed that *G. palpalis* would travel along the course of a river or shore-bank a mile to return to its former haunts. Hodges [28] gives the range of their flight from water as follows: "*natural range,*" *e.g.*, ordinary flight from waterside, 10 to 30 yards, rarely up to 50; "*following range,*" *e.g.*, the distance from waterside the fly will follow a man or animal passing through a fly area, 300 yards.

Finally, it may be added that, unlike many of the diptera, especially of the family *Muscidæ*, to which *Glossina* belongs, the fly avoids human habitations on account of its dislike of the odour of animal excreta [29].

*The Food of the Tsetse-Fly.*—The glossinæ of both sexes are voracious feeders on all vertebrate blood. The association of the "fly" with big game in South Africa was well known for many years to the natives and to all big game shooters. The gradual disappearance of the big game from that country has, to a great extent, coincided with the disappearance of the "fly." This association of the tsetse with big game refers more especially to *G. morsitans*, and would appear to be most marked in South Africa, where, before rinderpest swept the country almost clear of buffalo, the "fly belts" and the buffalo were numerous and coincided.

In East Africa the conditions would appear to be different, as several good observers have stated that the tsetse-flies are to be found in certain districts in large numbers where no buffalo or other big game exist.

Mr. Jackson [30] has expressed his belief that "the tsetse-fly is, like the mosquito, only a blood-sucker by predilection." Mr. Austen [31] doubts this opinion; he thinks it to be possible "for one generation of adult tsetse-fly, as for other adult insects, to continue to live for some time or for the whole period of existence without food, if the latter be not forthcoming." He adds: "Whether reproduction is impossible without such a meal, as appears to be the case as regards certain species of mosquitos, although apparently not the rule, remains to be proved" [32].

It must, however, be remembered that big game or man are not essential as food for the fly; they feed, as stated above, on *all* vertebrate blood, so that cormorants, very common inhabitants of East and Central African lakes, waterfowl, crocodiles, &c., may still give an ample food supply in the absence of all big game. The difference between the behaviour of the tsetse-fly in South and in East Africa may be due, as Mr. Austen suggests, to the fact that in East Africa the big open grassy plains are the favourite haunts of the game, which we have seen the fly will not frequent, whereas in South Africa the game favour the "bush" country.

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# ON THE EXCRETION OF ANTHRAX BACILLI IN MILK.

By Major W. H. HORROCKS.
*Royal Army Medical Corps.*

On December 17th, 1907, information was received that a cow had died suddenly in Catlan Bay, Gibraltar. On visiting the place I ascertained that the animal had been losing flesh for about a fortnight, but that it had taken its food well on the evening of December 16th. On examining the carcase, dark-coloured blood was found exuding from the anus and nostrils and the animal appeared slightly emaciated. The udder was flaccid, and the owner stated that, the cow being in a pregnant state, no milk had been secreted for about two months. The history and appearance of the animal suggested that the cause of death was anthrax; accordingly, smears were made with blood taken from an auricular vein, and, on staining by Leishman's method, were found to be crowded with typical anthrax bacilli. The udder was then manipulated, and 10 cc. of milk were collected in a test-tube. The milk had a normal appearance, and 5 cc. of it were at once injected subcutaneously into a guinea-pig. The remainder of the milk was centrifugalised, and the deposit plated on agar. On the fourth day after the injection, the guinea-pig, which appeared quite well on the previous day, died suddenly; a *post-mortem* examination showed the spleen to be enlarged and intensely congested, the lungs and liver were also congested, and there was some œdema of the tissues at the site of inoculation. Cultures were made from the spleen, liver, and blood, and typical anthrax bacilli were recovered. The following table gives the various tests applied to the culture isolated from the spleen and the results obtained. The table also shows the results observed when the same tests were applied to the laboratory culture of anthrax obtained from Kral's laboratory.

| | Culture isolated from spleen of guinea-pig | Anthrax culture (Kral) |
|---|---|---|
| Glucose peptone .. .. | Acid, no gas .. .. | Acid, no gas. |
| Cane sugar peptone .. | Acid, no gas .. .. | Acid, no gas. |
| Arabinose peptone.. .. | Unchanged .. .. .. | Unchanged. |
| Dulcite peptone .. .. | Unchanged .. .. .. | Unchanged. |
| Glycerine peptone.. .. | Unchanged .. .. .. | Unchanged. |
| Starch peptone .. .. | Faintly acid, 48 hours .. | Faintly acid, 48 hours. |
| Sorbite peptone .. .. | Unchanged .. .. .. | Unchanged. |
| Lactose peptone .. .. | Unchanged .. .. .. | Unchanged. |
| Maltose peptone .. .. | Acid, no gas .. .. | Acid, no gas. |
| Raffinose peptone .. .. | Unchanged .. .. .. | Unchanged. |
| Mannite peptone .. .. | Unchanged .. .. .. | Unchanged. |
| Salicin peptone .. .. | Unchanged .. .. .. | Unchanged. |
| Blood serum .. .. | White growth, medium liquefied | White growth, medium liquefied. |

| | Culture isolated from spleen of guinea-pig | Anthrax culture (Kral) |
|---|---|---|
| Potato .. .. .. | White growth .. .. | White growth. |
| Milk .. .. .. .. | Clotted in 48 hours and slowly digested, reaction not acid | Clotted in 48 hours and slowly digested, reaction not acid. |
| Broth .. .. .. | Flocculent growth, medium otherwise clear | Flocculent growth, medium otherwise clear. |
| Agar slope .. .. .. | Thick white growth, with rays at the margin | Thick white growth with rays at the margin. |
| Gelatine stab .. .. | Liquefaction at the surface, rays passing out into the medium from the growth along the stab | Liquefaction at the surface, rays passing out into the medium from the growth along the stab. |
| Morphology .. .. | Large square-ended non-motile bacillus. | Large square-ended non-motile baciillus |
| Gram stain .. .. .. | Positive .. .. .. | Positive. |

The above results show that the milk obtained from the udder of the cow contained virulent anthrax bacilli. As a further test, an emulsion of the agar growth from the spleen of the guinea-pig was poured over barley, and the infected food was then eaten by a small male goat. The blood of this animal was examined daily, but no bacilli were found until the morning of the fourth day, when the animal died suddenly and typical anthrax bacilli were recovered from the organs after death.

The centrifugalised deposit obtained from the bacilli present in the udder of the dead cow proved to be highly contaminated, but on one plate a typical convoluted colony appeared which was fished and planted on an agar slope. The resulting growth, composed of square-ended spore-bearing bacilli, was submitted to the tests given in the above table. It was then found that glucose was fermented feebly and gelatine was liquefied very slowly, very few rays being produced. In all other respects the results of the tests were similar to those given by the stock anthrax culture. In order to test the virulence of the milk culture, the agar growth, containing both spores and bacilli, was emulsified in 10 cc. of sterile water, and 2 cc. of the emulsion were injected subcutaneously into a guinea-pig. The remainder of the emulsion was poured over some barley and the infected food eaten by a small male goat. Blood smears from the guinea-pig and the goat were examined daily for three weeks, but no anthrax bacilli were ever detected; both animals remained quite well. It would therefore appear that the milk contained some attenuated anthrax bacilli devoid of virulence in addition to the typical virulent forms which caused the death of the first guinea-pig

Experimental investigations having shown that anthrax bacilli appear in the blood of an infected animal only a few hours before death, it appeared desirable to ascertain whether it is possible for the bacilli to be excreted in the milk before they appear in the blood. If the bacilli are only excreted in the milk simultaneously with their appearance in the blood, then the risk to the public will be limited to a few hours, viz., practically to a morning or evening milking. Accordingly, on February 27th, 1908, the growth on an agar slope, obtained from the first subculture of the growth from the spleen of the guinea-pig killed by injecting milk from the cow that died of anthrax, was emulsified in 10 cc. of sterile water, and 2 cc. of this emulsion were then injected subcutaneously into a female goat. Milk from this goat was injected into a series of guinea-pigs as follows:—

Guinea-pig No. I. was injected subcutaneously with 5 cc. of milk collected at 4 p.m. on February 27th, 1908.

Guinea-pig No. II. was injected subcutaneously with 5 cc. of milk collected at 9 a.m. on February 28th, 1908.

Guinea-pig No. III. was injected subcutaneously with 5 cc. of milk collected at 4 p.m. on same day.

These three guinea-pigs were examined at frequent intervals, but no anthrax bacilli appeared in the blood smears and the animals were quite well a month after receiving the injections. Blood smears made from an auricular vein of the goat were also examined, but nothing was seen until February 29th, when the goat died suddenly in the early morning and a blood smear made from an auricular vein at 9 a.m. was then found to be teeming with anthrax bacilli. Milk was removed from the udder of the dead goat and 5 cc. were injected subcutaneously into guinea-pig No. IV. Five cc. of the milk were also centrifugalised and the deposit plated on agar. Guinea-pig No. IV. died on the third morning after receiving the injection of milk, and typical anthrax bacilli were recovered from it. The plates made with the centrifugalised deposit from the goat's milk showed numerous convoluted colonies, which were subcultured and submitted to the tests shown in the preceding table. The results of the tests corresponded to those of the stock anthrax culture. The agar growth obtained from one of the colonies was then emulsified in 10 cc. of sterile water, and 2 cc. of the emulsion were injected subcutaneously into guinea-pig No. V. Forty-eight hours later this guinea-pig died, and typical anthrax bacilli were recovered from it.

The above results prove conclusively that virulent anthrax bacilli are excreted in the milk of animals dying from anthrax acquired either naturally or artificially, but that the excretion of the bacilli only occurs a few hours before death, and consequently, the risk to the public is practically limited to one milking.

# AFRICAN TICK FEVER—A PERSONAL EXPERIENCE.

By Captain A. C. H. GRAY.

*Royal Army Medical Corps.*

Up to the end of March, 1907, although I had lived nearly three years in tropical Africa, I had not suffered from fever of any description. It is true that a good deal of this time I had lived in Entebbe, the administrative capital of Uganda, in a house which was more or less mosquito-proof, and which had a cement floor. However, malarial fever is common among Entebbe residents at certain times of the year, and the use of a mosquito-net is very necessary, even in houses supposed to be mosquito-proof.

As far as I know, no European has contracted tick fever in Entebbe; the numerous cases which have occurred have always been in people who have recently come in from "safari." The spirillum tick cannot, or at any rate does not, exist in a proper cement-floored house, raised on a stone plinth, with wooden ceiling and tin roof. This, in varying sizes, is the general type of European house at Entebbe and some other stations in Uganda. Up till a year ago the servants' quarters attached to these tin houses were nothing more than grass-roofed mud-huts, and ticks could often be found in them. These huts, I am glad to say, have all been pulled down and replaced by tin buildings. I hope that now it will be impossible to find a "spirillum tick" in the European quarter of Entebbe. So long, then, as one lives in a station one runs little risk of getting tick fever in Uganda.

On March 22nd, 1907, I received orders from the Deputy Commissioner to proceed the next day with Major R., the Officer Commanding 4th R.A.R., and the Adjutant, Captain R., to a place called Mbale, about twenty miles from Entebbe. I was to report on the suitability or otherwise, from a medical point of view, of a site close to Mbale for the proposed "concentration" of the battalion.

We did not start till nearly 11 a.m. on Saturday, March 23rd, owing to a difficulty in getting sufficient porters at such short notice, and we arrived at Mbale after sundown in pouring rain. It was too late, and too dark, to set about clearing the elephant grass to make a new camp for ourselves, so we pitched our tents on an old camping ground at Mbale, dining in a mud hut which stood there, but sleeping in our tents.

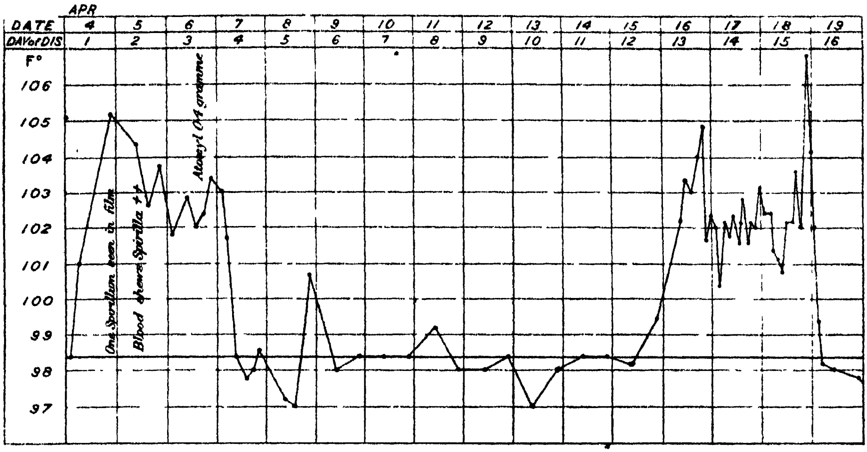
During the process of dressing on Sunday morning my "boy" brought me the shirt that I had been wearing the previous evening at dinner, and showed me a tick on its inside. The tick was a nearly full-grown female specimen of *O. moubata*, the carrier of tick fever. This tick had certainly not fed fully or even largely of late, but there was a trace of blood inside it. A prolonged search through the rest of my clothing, bedding and tent failed to bring to light any further specimens. On telling my brother officers what I had found, a general search was made through their clothing and bedding—two more ticks were found, both in Major R.'s bedding, but on the outside of his mosquito net, where it was tucked under the mattress of the camp bed, so there was the probability that neither of these ticks had bitten him, especially as neither of them contained any trace of blood. On the other hand, it was probable that my tick had bitten me. It had probably fallen off the roof on to me as we sat at dinner in the mud hut on the previous evening.

The morning was spent in examining the proposed site for concentration, which was about three miles from our camping ground. On the same afternoon we returned to Entebbe; so that I was only away from Entebbe this one night of March 23rd.

For eleven days after I felt perfectly well, but on the evening of April 3rd (the eleventh day), after dinner, I felt rather seedy and went to bed early, but hardly slept at all, a most unusual thing for me.

At 4 a.m. on April 4th my temperature was 101° F., and it rose steadily all through the day to 105° F. I had a bad headache and a great deal of pain in my back and over the region of my stomach. A blood film taken on the evening of April 4th showed one spirochæte after a prolonged search. My temperature remained between 102° and 104° F. until the morning of April 7th, when it suddenly fell by crisis to normal within two hours. The fall of temperature was accompanied by very profuse sweating, and I went to sleep for the first time for three nights. Blood films taken on April 5th and 6th showed spirochætes in scanty numbers. I examined the slides myself afterwards and found eight spirochætes during a quarter of an hour's search. From 8 a.m., April 7th, to 8 p.m., April 15th (eight and a half days), I was perfectly well, though at first rather weak from the fever.

On the evening of the 15th my second attack began, lasting in all exactly three and a half days as before. At the end of the third day of this attack I had a sudden, very acute rigor, my temperature ran up to 106·8° F., and I vomited for the first time.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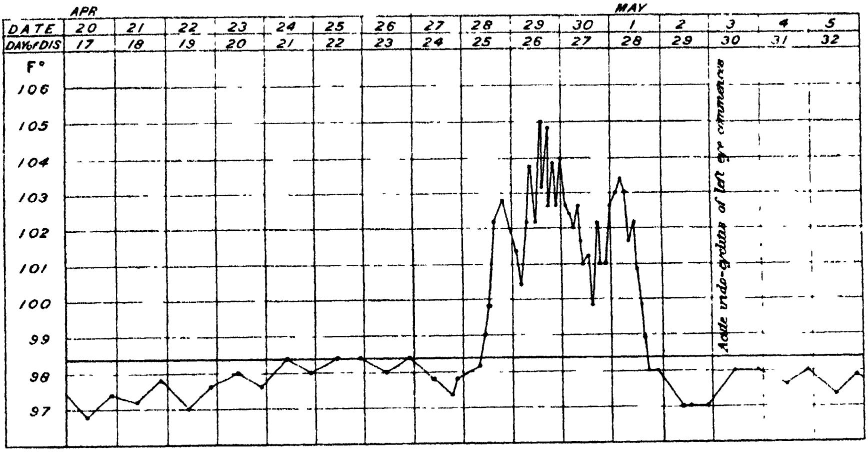
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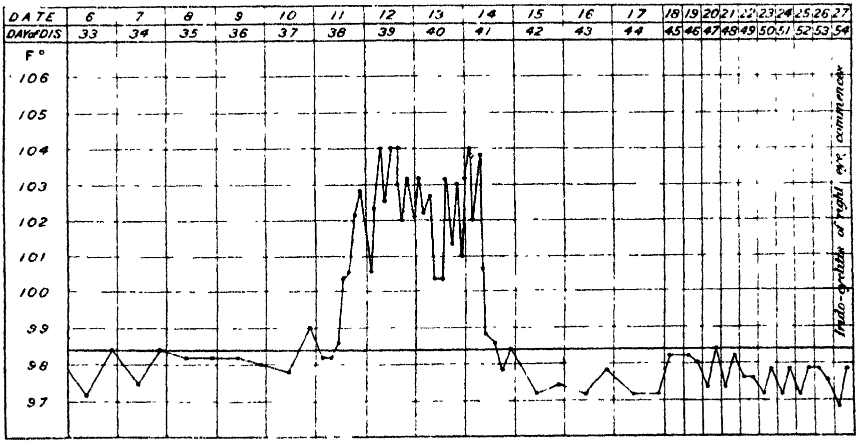
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Irido-cyclitis of right eye commences

A cold water douche brought the temperature down and it fell, again by crisis, to normal.

The third and fourth attacks were just the same. Each attack lasted three and a half days (eighty-four hours); the interval between the attacks was almost exactly nine days in each case.

A consistently high temperature lasted all through each attack. A false crisis nearly always occurred about twenty-four hours before the real crisis (see chart). Pains in the back and stomach, headache, with great restlessness, commenced as soon as my temperature reached 101° F., and disappeared at once with the crisis. Morphia was the only drug that gave any relief, and this, though it never produced sleep in my case during an attack of fever, yet always made one feel contented and happy. At my own request I was given atoxyl during the first and just before the second attack; 0·4 gramme was given on each occasion, a fairly large dose, yet it had no effect at all in either shortening the first or delaying the onset of the second period of fever. Its further use was therefore abandoned. Phenacetin generally reduced a high temperature two degrees for an hour or two, but the subsequent temperature was quite as high, if not higher than before. On May 3rd, some thirty-six hours after the third pyrexial attack, I woke up suddenly about 3 a.m. with very acute pain in my left eye. On lighting a match I noticed that there was much photophobia and blurring of vision in my right eye, the candle which was lit simply appearing as a thick yellow fog with coloured rings at the circumference. There was marked injection of the vessels in the ciliary region, and increased tension of the globe. The iris seemed clear. The anterior chamber was clear. It seemed to me as if there had been a sudden effusion of serous fluid into the vitreous, which would have accounted for the sudden onset of pain, increased tension, and fog-like appearance of objects. The repeated application of a sponge wrung out of very hot water gave great relief.

A 5 per cent solution of homatropine hydrobromide was instilled into the eye repeatedly every three hours; dilatation was very slow and was not complete for forty-eight hours. The ciliary injection became more and more marked, and the tension of the eye increased. Eserine was substituted for the homatropine. The pain of the eye was considerable, but was always relieved by hot water. The ciliary region was extremely tender. The eye was kept bandaged and the room darkened. On May 9th, the eye was much better, but the vision had not improved. Fingers held up within a yard could not be counted. On May 11th the fourth attack of fever commenced, but the eye symptoms were not increased by it. On May 27th the right eye was uncomfortable and slight ciliary injection was present; and pain, tenderness, photophobia and blurring of vision came on in turn. The tension of the globe increased slightly. On May 30th the condition of the left eye was exactly similar to what had previously been noted in the right. By this time the right eye was very much better, the ciliary injection had nearly disappeared, but vision, though greatly improved, was still deficient. By June 8th the left eye (the one first affected) was practically well and vision normal, and by the end of the month my right eye appeared normal, although vision was still somewhat faulty, due apparently to opacities in the vitreous. The period of inflammation was just five weeks for each eye. The eye first attacked was treated first with homatropine until full dilatation was obtained. Owing, however, to the marked increase of pain and tension in the globe, eserine was subsequently applied and gave relief. The right eye was treated in a similar way. I was kept in a dark room from the first, and my eyes were bandaged during the periods of acute inflammation. On May 15th slight paralysis of the right side of the face appeared, but soon passed off.

The attacks of fever were followed by a period of nervous disturbance or "jumpiness" (for want of a better word). Twitching of the limbs and fingers occurred for three weeks after the fever was over, and one talked and laughed in a silly sort of way for no apparent reason. A sort of nervous dread of making a fool of one's self was almost constantly present quite a month after the fever. In all the cases of tick fever in Europeans that I have seen, this nervous disturbance, after the fever has worn itself out, has been very marked.

Tick fever is quite the worst of the many non-fatal diseases that occur in Uganda, and is becoming more and more common every year. The above is a typical severe case.

The fact that infection could only have taken place on the evening of March 23rd, fixes the incubation period absolutely in this case at eleven days. Infection was almost certainly carried by one tick only. Each pyrexial attack lasted eighty-four hours. The interval between the attacks was nine days. As a rule, a first attack of tick fever in a European consists of six periods of pyrexia, the first four very marked and of much the same severity, the other two generally slight. In my case there were but four attacks of fever in all, all severe and of much the same severity.

The onset of this disease is generally abrupt, as in my case. Obstinate vomiting is said to be an initial symptom in Europeans, but I am glad to say that it was not so with me. I only vomited once, and that during the second period of pyrexia when my temperature ran up. Headache, pains in the back and stomach, and great restlessness, are nearly always prominent symptoms.

It is generally difficult to find spirochætes in a blood film taken on the first day of the fever. In my case Dr. Strathairn found one after a prolonged search. A film taken on the second day showed spirochætes more easily. Spirochætes were never found in films taken during the intervals of a pyrexia.

With regard to *complications*. The commonest is a very high temperature. A temperature of over 105° F. during some part of an attack is the rule. In my case the temperature ran up to 106·8° F., which may be called "hyperpyrexia." *Rigors* are not uncommon and accompany a very high temperature. An acute inflammation of generally only one eye occurs in nearly half the cases of tick fever seen in Europeans. This generally comes on as a sequel to the disease some while after the pyrexial attacks. In my case the eye symptoms began in the left eye between two attacks of fever. This "spirillum eye" has been described in the last edition of Allbutt and Rolleston's "System of Medicine" as an iritis pure and simple. The general opinion of Uganda medical officers, however, is that it is not so. I have never seen a "spirillum eye" with a cloudy, dull iris at the commencement of the inflammation. Marked ciliary injection, great pain and tenderness of the globe, and increase of tension, are the initial symptoms, pointing to inflammation of the ciliary body or cyclitis. The inflammation may afterwards spread to the iris, but it is not the rule. Facial paralysis lasting a few days is a quite common sequel to tick fever. Just lately there has been a very distressing case where this facial paralysis has persisted, and the patient has had to be invalided home in consequence.

With regard to *treatment*, no drug has yet been found capable of cutting short the pyrexial attacks. On the analogy of trypanosomes and spirochætes, I was given two injections of atoxyl once during an attack of fever and once just before the attack of fever was due. In neither case was there any result. Great restlessness and want of sleep may be treated with morphia. The immediate relief is very striking; sleep returns directly the fever is over, and, as the attacks of fever only last four days, there is no danger of producing in the patient a "liking" for the drug. A milk diet during, and as much nourishing food as possible between, the attacks of fever is good treatment. As cyclitis or iridocyclitis is such a common sequel, the sick-room should be darkened from the beginning, and dark blue spectacles regularly worn during the normal intervals. As far as possible all reading and writing should be avoided. Eye symptoms when they do occur require energetic treatment. A darkened room is essential. Pain is best relieved by the application of a bath sponge wrung out of very hot water. If the tension of the eye is much increased, eserine rather than atropine should be used, but in no case should atropine treatment be continued after the acute symptoms are over. Alcohol should be avoided. Blue spectacles should be worn for a month after all acute symptoms have disappeared. The transitory facial paralysis which commonly occurs after tick fever rarely requires special treatment. If the paralysis does not disappear in a few days electrical treatment should be instituted, and the eye on the paralysed side kept covered to avoid dust. During convalescence draughts should be carefully avoided.

With regard to *prophylaxis* the moral to be drawn from my case is:—

(1) Do not start on a twenty-mile "safari" in Uganda late in the day, but arrange matters so that camp will be reached not later than 2 p.m. There will then be plenty of time to clear a proper site for yourself before sundown.

(2) Avoid old camping grounds like poison.

# A FURTHER NOTE ON THE WAYS OF COMMON FLIES IN INDIA.

By Major F. Smith, D.S.O.
*Royal Army Medical Corps.*

In the Journal for August, 1907, I wrote of certain ways of the larvæ of flies in regard to retreating from their feeding material to the earth, and there taking on the pupal stage. In the course of experiments leading up to that paper it had been noticed that the number recovered from the earth was small compared with the number originally seen in the fæces. There was difficulty, too, in comprehending the course of events when the material in which the larvæ were bred happened to be upon hard rock into which no larva could penetrate. It seemed unlikely that the larvæ had no way of evading extinction in such a case. I surmised that they left their nutrient home in the night, under cover of the darkness, and at a time when they would not be exposed to the fierce rays of the sun. With a view to the elucidation of this problem a number of experiments were carried out.

I need not waste space in the Journal by detailing the experiments. It is enough to say that they show conclusively that the larvæ sometimes travel for long distances in search of resting-places. A good many move in the night, but they were seen also moving in the daytime very actively as though anxious to hide themselves; and they can stand the mid-day sun for a long time. An individual maggot was seen to travel 10 feet along some brickwork pavement until it disappeared in the grass at the edge of the brickwork. On the way it penetrated little collections of dust and cracks in the mortar, reappearing when it found that these were not suitable resting-places. Sparrows which were about the place did not seem interested in the larvæ. Their chief enemies appeared to be small brown ants, which carried off many maggots. At the end of three days the dried residue of fæces was removed from one experimental box and the box enclosed in a net. Five hundred and forty-eight flies were hatched out from that box—from a single deposit of human ordure; and this number does not include those which escaped in the maggot-stage or were carried off by the ants.

The wandering habit is not peculiar to the larvæ of one kind of fly. The larvæ of *Musca, Pycnosoma, Sarcophaga,* and other diptera which breed in dead animals and in ordure, behave in the same way.

Observation had led me to think that less than three days feeding would be enough to fully develop a maggot. Experiments in this direction were therefore made, and they proved that forty-eight hours in the sun at a temperature of 81° F. suffice as a feeding time. From the dry, coarse powder found underneath the thin, hard shell of the original deposit, maggots were taken. They were put in test-tubes with dry silver-sand from a bottle in the laboratory. The sand had come from an English chemist and was for laboratory purposes. Imagination cannot conceive of it as affording any nutriment for maggots. Some of the maggots pupated in a few hours, others took four days to pupate. They duly hatched out, one variety of fly appearing on the eighth day, another on the eleventh, and a third on the twenty-first. Probably, the sand was not necessary to the welfare of the maggots—for maggots of *Pycnosoma* and *Musca entæniata* which had been fed for three days only were put in dry, empty test-tubes and they pupated and hatched out in due course in the usual time. The maggots were counted into the test-tube and compared with the number of flies in order to exclude cannibalism as a cause of survival.

I think it probable that a shorter period than even forty-eight hours feeding is necessary in some circumstances to enable the maggots to develop sufficiently to pupate—the main factor, no doubt, being heat.

## SUMMARY.

(1) No place upon which ordure is deposited can be said to be of itself unsuitable for the development of flies, provided flies can reach the ordure and provided the maggots can either by falling or crawling reach a place in which to pupate.

(2) For the larvæ of flies forty-eight hours is a sufficiently long feeding time to permit of the post-maggot stages being gone through.

(3) After forty-eight hours the maggots do not require moisture beyond any which they may be supposed to get from the air.

In conclusion, I think it safe to suggest that in India, where the whole country is littered with fæces, the flies bred out of excrement deposited on the ground by men and animals are greatly in excess of the number from any other source, whether in or out of cantonments.

# A NEW INDICATION FOR OPERATION IN OTITIS MEDIA SUPPURATIVA.

By Captain R. C. WILSON.
*Royal Army Medical Corps.*

For the last few months certain Continental otologists have been employing a test which consists of turning, arresting the movement suddenly, and examining the nystagmus of the eyes which is produced, in order to estimate the condition of the labyrinth in those suffering from otitis media suppurativa, whether in its acute or chronic form.

The susceptibility of the labyrinth to infection will at once be apparent to anyone recalling the exposed position of the external semi-circular canal which, protruding as it does from the antral wall, is brought into the midst of the chief site of suppurative activity in mastoid disease. The danger of infection of the labyrinth cannot be over-estimated, nor can the importance of recognising when it is implicated, or on the verge of being implicated in disease, be too strongly emphasised from the standpoint of prophylactic surgery, when we remember that the meninges are more often infected from the antrum *viâ* the labyrinth than from the tympanum *viâ* the tegmen tympani, in spite of the occasional dehiscences of this; for by its position it has the advantage of better drainage, being situated above the level of the pus, and is less liable to the effects of pressure than the walls of the antrum. Given an infected antrum, the pus here is held as it were in a cup, whereas the pus in the tympanic cavity can escape by perforating, or by flowing through an old-standing perforation of the membrana tympani.

The most important structure in the antrum, and the one susceptible to the action of pus, is the external semi-circular canal, which, as already noted, lies in relief on the inner antral wall. Erosion of it is, therefore, likely to occur. Erosion frequently does occur, and in a typical way: the bone is split so that a fistula is formed; this may be diagnosed by giving, in a proportion of cases, what is technically known as a "fistula symptom"—nystagmus occurring when, by raising the air pressure in the tympanum by means of an olive fitted to an air balloon, the membranous canal is pressed upon, this in its turn influencing the endolymph in the interior of the canal.

Now, as nystagmus arising from the semi-circular canals is the valuable sign of which I speak in all cases of suppurative middle-ear disease, its history and nature and the history of its relation to the ear must first be explained. The latest otological text-books give us little or no information on the subject. We are indebted to the pamphlet of Dr. Robert Bárány for a carefully written account of its physiology. Purkinje was the first (1825) to notice nystagmus produced by spinning round insane persons (a method then in vogue of quieting unruly patients), but he attributed this nystagmus to centrifugal force acting on the brain. It was in this year that Flourens made his classical experiments in Paris on the semi-circular canals of pigeons, recording the disturbances of equilibrium which resulted on section of these. Goltz, in Strasburg, noticed the vertigo produced by syringing out the ear (and vertigo is related closely to the causes of nystagmus). Breuer and Mark, from their experiments with rotation, were the first to attribute the perception of change of position to the semi-circular canals.

But to the experiments of Ewald we owe the basis of the exactness of our knowledge. It was he who prepared the semi-circular canal of a pigeon and found, when he touched it and moved the endolymph, that movements of the eyes resulted, but these were to him then indiscriminate movements. He next proceeded to investigate the connection between the direction of the eye movements and the directions of the movements of the endolymph. He filled one canal with a plug, so that the endolymph was limited to movement in one direction—towards the ampulla. He found, taking the right canal, that if he caused the endolymph to flow towards the ampulla he got slow movements of the eyes as if in continuance of this direction, *i.e.*, towards the left.

To produce a movement in the opposite direction, he fixed a glass piston within a tube to the semi-circular canals and connected the apparatus to an air-bag; when he pressed this, the lymph went towards the ampulla, and when he aspirated, the lymph was drawn away from it. He found that when he aspirated the endolymph from the ampulla of the right semi-circular canal the eyes turned towards the right; when he pressed the endolymph towards the ampulla the eyes turned towards the left. He found *that the motion of the eyes followed the motion of the endolymph.*

Thus this fact was established. Having this explanation, we find that we could almost postulate it when we consider that it is to the movements of the endolymph we owe our perception of the change of our position in space. If anyone cares to test this, let him close the eyes, keep his fingers lightly on the cornea as it lies under the closed lid, and turn round. He will feel the eye moving under the lid, as if attempting to sweep out new fields in space, and so keep him informed of the new position he is assuming. The eye cannot have informed itself, for it remains closed; so its movement and stimulus to act come to it from the ear, and the experiments of Ewald showed the connection between the movements of the endolymph and the eye. Let us see this in practice. If we suddenly revolve to the right three times and stop, what happens to the endolymph in the semi-circular canal of the right ear? This canal lies, of course, horizontally with its ampulla containing the crista ampullaris at its anterior end. The endolymph in this canal, at the beginning of the movement, tends to be left behind on account of its inertia, somewhat in the same way that the water in a saucer would be left behind if we were to suddenly pull the saucer; but the canal being closed, all that happens is a momentary aspiratory effect on the crista ampullaris of the canal. This tends to make the eyes momentarily look back, as it were, while the head is being turned (but this motion, which has a negative effect for a moment on the right ampulla, has a positive effect on the left ampulla of the other side; and as the result of positive stimuli of the ampulla has been found

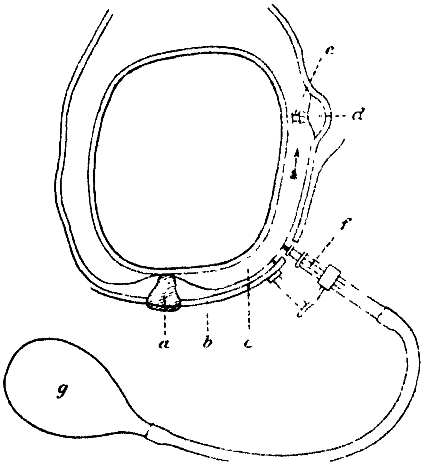

FIG. 1.—*a*, Lead plug; *b*, bony wall; *c*, lumen; *d*, crista ampullaris; *e*, cupula; *f*, pneumatic hammer; *g*, air-bag.

to be as 3 is to 1, the momentary negative effect at the beginning of motion in the right semi-circular canal is rendered very negligible by the positive effect coming from the left), and then the endolymph tends to gather weight, and comes, when the motion suddenly stops, to strike the crista with the accumulated force its inertia and velocity lend. Thus, by stopping suddenly during rotation, we tend to magnify the stimulus which movement of the endolymph imparts to the crista ampullaris. The endolymph impinging on this termination of the vestibular division of the eighth nerve gives rise to a stimulus which is conveyed to the

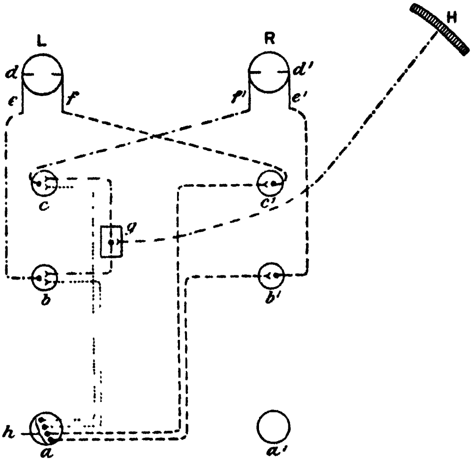

FIG. 2.—$a\ a'$, Deiter's nucleus; $b\ b'$, abducens nucleus; $c\ c'$, oculo-motor nucleus; $g$, sight centre for looking to left; $e\ e'$, external rectus muscles; $f\ f^1$, internal rectus muscles; $d\ d'$, left and right eye; $H$, cortex; $h$, vestibular portion of eighth nerve.

nucleus of Deiter's in the restiform body. This centre sends out its message to the eyes, that they may not, to put it crudely, "be left behind" in keeping the turning head informed of what objects may lie in the field of the new position it comes to take. Now, if we voluntarily resist this central impulse to turn the eyes in the direction the head is being turned in, and force them to look against that direction, nystagmus will result.

To make clinical use of these facts, for an example, take a normal person, ask him to close his eyes, turn him three times to the right on a piano stool or pivot chair, stop him suddenly and get him to look against the direction of turning, *i.e.*, to his left.

We expect nystagmus to last from five to fifteen seconds. The reason for this is that though the patient stops, the endolymph does not stop, but continues to stimulate the crista ampullaris, causing a tendency in the eye to keep on moving in the direction of rotation; but the patient voluntarily strives to look in an opposite direction, so motions of the eye which we term nystagmus result. Fig. 2 is a scheme of the nerves and nervous impulses involved.

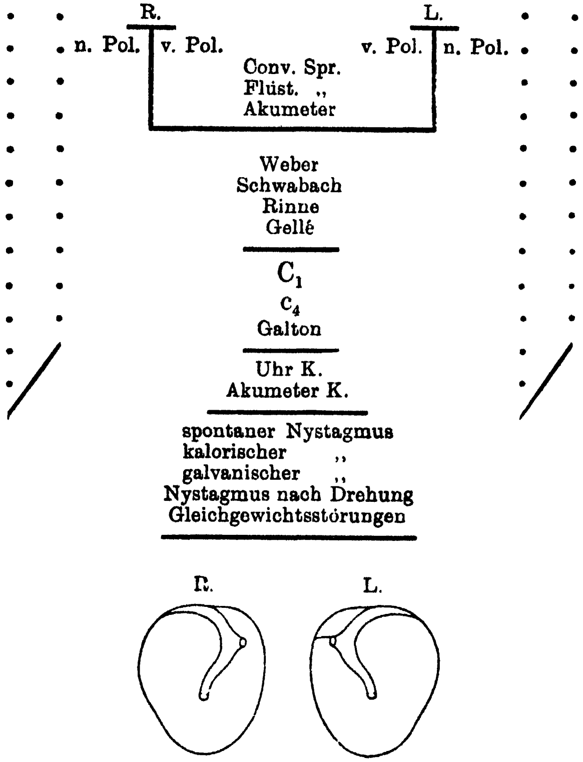

FIG. 3.

Now in disease, when the semi-circular canals are *beginning to be* affected, they are rendered much more sensitive, as is the case in every other tissue. The result of stimulating the hair cells in the crista is more effective and gives rise to nystagmus lasting through a longer period. We are thus in a position to estimate the condition of the semi-circular canals on stopping a patient suddenly after three brisk turns and making him look against the direction of rotation: (1) Nystagmus lasting from five to fifteen seconds—normal; (2) nystagmus lasting longer than fifteen seconds (twenty-five to sixty seconds)—infection imminent; (3) nystagmus absent—pus-filled labyrinth.

Of course, anything causing movements of the endolymph, besides rotation, will give rise to nystagmus and affect the centres equally in proportion to the stimulation its movement exerts in the crista. In this category are (*a*) caloric stimuli (hot and cold water syringed into ear) which influence the flow of endolymph, causing convection currents in it; (*b*) galvanic nystagmus. A list of these is contained in the accompanying chart (fig. 3) for routine examination of the cases taken from one of the Continental clinics, which may also serve to illustrate the importance in which this new indication which I have endeavoured to describe is beginning to be held.

I am indebted to my friend Dr. Gogarty, of the Richmond and Hardwick Hospitals, Dublin, for demonstrating this sign to me. He was the first to make practical use of it in aural operations in Dublin.

The diagrams are copied from "Physiologie und Pathologie des Bogengang-Apparates beim Menschen," by Dr. Robert Bárány, Vienna.

# THE PLACE OF SANITATION AS A FACTOR IN STRATEGY.[1]

By Lieutenant-Colonel C. H. MELVILLE.
*Royal Army Medical Corps.*

In the year 1828 a Russian Army, computed by a Prussian officer, Baron (afterwards Field Marshal) Von Moltke, who wrote a history of the campaign, at about 100,000 strong, invaded Turkey. Two years later it returned to Russia 15,000 strong. In the words of von Moltke, "besides the enemy whom they opposed, the Russians had to contend with another invisible foe, which hung upon their footsteps, crossed the Balkans with them, and attacked them with fearful violence after they had concluded an advantageous peace. This foe was disease." "Several German surgeons," he continues, "have drawn a fearful picture of the state of the Army, which, though victorious in the field, was completely vanquished in the hospitals."

Between May, 1828, and February, 1829, out of the strength above stated, there were over 200,000 admissions to hospital. In January of the latter year 6,000 men died. In 1829 the Russians crossed the Balkans, and on the southern side of that range got free from the plague which had scourged them so severely on the north, only to fall under the more severe scourge of malaria and dysentery. In July, 1829, no less than 40,000 men, more than half of the available strength of the Army, lay in hospital. As Baron von Moltke says, "such an extraordinary state of health, or rather of sickness, could not have been foreseen; it far exceeded all calculation, and it is difficult to form a conception of an Army engaged in offensive operations of which the larger half is lying in hospital."

I have not introduced the above somewhat hackneyed incident of military history without some reason. I do not suppose that it is new to any of you. I had a reason which I will now proceed to develop.

No profession stands, or indeed can stand, by itself. In intimate relation to every profession stands a ring, as I may say, of other professions, without the aid of which the profession in question, the central profession, cannot attain its full object. But though this is true, still the central profession continues the dominant profession and the others merely ancillary thereto. Now it is not open to every profession to declare itself ancillary to another profession. It must first show cause why it should be so considered. And to show this it is necessary for it to satisfy three postulates. These postulates are:—

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[1] A lecture delivered to the Junior Class at the Staff College, Camberley, on February 18, 1908.

Firstly, the ancillary profession must show that it deals with subjects that affect to an important degree and adversely the work of the dominant profession.

Secondly, the ancillary profession must show that it can, if allowed free scope, remove the obstacles which these adverse subjects (if I may use a somewhat clumsy expression) place in the path of the dominant profession, and

Thirdly, and this is far the most important postulate of the three, the ancillary profession must show that it can remove these obstacles without itself hindering the work of the dominant profession.

Now, then, as regards the first of my postulates. I think that the instance of the Russian campaign against Turkey that I began my talk with, fairly satisfies that. It is beyond discussion that the subjects with which my profession deals do affect adversely the task that your profession has to perform. It is, I think, needless to multiply instances. The British Army in Walcheren, the French Army in Madagascar, every army of the world in one or other of its campaigns, can furnish more than sufficient evidence on this point. I think, therefore, we may assume the truth of the first postulate.

We come, therefore, to the second postulate. Can my profession, if allowed free scope, remove from the path of your, the dominant, profession, the obstacles which epidemic disease interposes on its road to success? Of this I must give proof. And first I would draw attention to the words "If allowed free scope." Now the only time when we as sanitarians are allowed free scope (the only time, I am ready to admit, when we can justifiably claim free scope) is in time of peace. During that time the objects of my, the ancillary, profession, do not come into antagonism with those of your, the dominant, profession. On this point I can claim to speak with some assurance. During the past seven years I have had the honour to hold successively the posts of Sanitary Officer of a Command in India, Sanitary Officer at the Headquarters of the Army in India, and Sanitary Expert on the Army Medical Advisory Board, so that I can claim to have come into contact on sanitary questions with practically the whole of the Army at home and abroad. I am generally, I may say, credited with being rather advanced in my notions on sanitation, but never have I yet come across serious opposition from any member of any staff with which I have had to work. If my work or my ideas had been at all opposed to their ideas of what was good for the Army, I know well enough that I should have received such opposition, and justifiably so, but I never did. Therefore it is sufficient, for the purpose of satisfying this second postulate, if I can show that in time of peace, when it is allowed free scope, my profession can abolish these obstacles which epidemic disease places in your road to success. For this purpose I will take three diseases in three several parts of the world, Tubercular Diseases in the United Kingdom, Malta Fever in Malta, and Cholera in India.

To begin with Tubercular Diseases. In 1860, with an army under 200,000 strong, we lost by death and invaliding from this cause 1,143 men. In 1906, with an army 230,000 strong, we lost only 590 men, a reduction of nearly 60 per cent. It is interesting to note that this diminution, though accompanied by a diminution in the incidence of the same disease amongst civilians of the same age, was greater in the Army than in the civil population. The difference in favour of the Army may be placed at 30 per cent. Now the greatest change that has occurred in the daily life of the soldier since 1860, is undoubtedly in the direction of better housing. What his surroundings were in 1860 can be judged from the report of the Royal Commission appointed in the year 1857 to enquire into the sanitary condition of all barracks and hospitals in the United Kingdom. I will not trouble you with any details from that report, they are sufficiently startling, rather disgusting and exceedingly interesting. The ultimate conclusion to which the Commission came was, that the over-crowding then existing represented a deficiency of over 32 per cent. in the barrack accommodation of the United Kingdom. As a result of the Report of that Commission steps were at once taken to improve the barracks occupied by the Army, more especially in the direction of giving a larger amount of air space to each man. Step by step since that date the sanitary recommendations of that Committee have been given effect to in the gradual reconstruction of old and the building of new barracks in this country. Step by step with that improvement in the accommodation of the soldier, has the loss to the Army from Tubercular Diseases decreased till it has reached its present figure. That the one improvement has been the direct cause of the other, is as certain as any fact in sanitation can be.

We come next to Malta Fever. In the year 1900 this disease caused 158 admissions in the garrison of Malta, in the year 1906 it caused 161 admissions, and in the year 1907, 11 admissions, the proportions in the last two years being respectively twenty-four and two per thousand of strength. To what was this reduction due? To the discovery by a Committee of the Royal Society, that the peculiar micro-organism to which Malta Fever is due, was habitually present in the milk of the Maltese goat, and the consequent discontinuance of the use of that milk in barracks. The net result of this reduction in the incidence of Malta fever has been a saving of 46,729 days efficiency, and that is 46,729 day's pay, in 1907, to the British Government. This is calculating only on the basis of so many days in hospital to each sufferer from the disease. But to this we have to add the expense of invaliding, 43 in 1900 (which is nearly four times the total admissions of 1907) and the loss by death of trained soldiers, 8 in 1900, and 1 in 1907.

Coming now to Cholera in India. In 1867, 529 men died of this disease, in the last ten years of which we have record (1897-1906) 318 men died. These figures speak for themselves. I do not know if any of you here present knew India twenty years ago, probably not; but I remember well how we used all to try for early leave, because one was almost certain to be recalled in the latter months of the leave season because of Cholera. It might be a few cases, or it might be many, but Cholera there was sure to be, till we recognized the necessity of watching the water supply. Cholera does not enter into one's calculations now as a regular annual visitant. The cause of this decrease has been the introduction of good water supplies in some stations, and the greater vigilance exercised over the water supply in those stations where no such radical alteration was possible. In those days we had the constant dread of cholera hanging over our heads. A very real and a very paralysing dread, till we learnt the true cause of this disease. I do not wish to dwell too long over this second postulate. I think that the instance of these three diseases, and their enormous reduction in these late years, proves that given free scope my, the ancillary, profession, can remove from the path of your, the dominant, profession, three very substantial obstacles in the road to success.

We now come to my third postulate, and this is the crucial one of the three. This is the point where all dominant professions come into conflict with their ancillary professions.

You yourselves, from your study of military history, know how often your demands as an ancillary profession come into conflict with the aims of the politician who, as regards you, holds a dominant position. The reason of this conflict is that the practitioners of the ancillary profession forget that the only justification for their position is that they should further the aims of the dominant profession. The moment they begin to lose sight of the fact that they are bound to forget the aims of their own profession and think only of the aims of the dominant profession, they are in danger of having their claims to recognition disregarded entirely, and justly so. The aim of your profession is to defeat your enemy, therefore the aim of my profession must be the same. The enemy must be defeated, be the Army healthy or not. If it can be kept healthy so much the better, but this must always be a secondary consideration. I know that many soldiers say that it is impossible to combine the two, that one of the prices of victory is disease, just as another of the prices is the list of killed and wounded. To a certain extent I am ready to admit this. It is out of the question to suppose that an army in the field exposed to all the bodily and mental strain entailed by even a successful campaign can be kept as healthy as an Army in cantonments. At the same time something can be done. To prove this it is only necessary to compare the losses due to disease in campaigns in the same or similar countries at different times; for instance the three Ashanti campaigns of 1828, 1874, and 1895. In the first the expeditionary force was entirely broken up by disease, those who did not die becoming ineffective on this account. The same fate befell the reinforcements which were sent up later. In the 1874 expedition the death-rate was 1·7 per cent. In 1895 this ratio fell to a little over ·5 per cent. Compare, again, these figures with those for the French Expedition to Madagascar, admitted by the French themselves to possess a comparatively healthy climate, in 1895, in which the regular troops lost one-third of their strength through disease, one regiment losing over 1,000 men, and a company of engineers about two-thirds of its strength. The greater part of this appalling mortality was due to malaria fever, and was, therefore, in the strictest sense, avoidable. Still, resting on the Ashanti figures only, it is obvious that the sanitary precautions that were taken in the second and third expeditions did not militate against the success of those expeditions, whereas their absence in the first completely wrecked the campaign.

There is another aspect to the case which should not be forgotten. It may often be necessary to throw away a thousand men by disease to win a strategical success, just as it may be necessary to throw away a regiment under the fire of the enemy to win a tactical one, but losses in action and losses by disease are very different things.

Fifty years after Albuhera the losses of the 57th in that action were utilised to stir the courage of the men of the same regiment at Inkerman. Can you imagine the Commanding Officer of the 28th relying on the fact that the regiment had served at Walcheren to nerve his men to face malaria in Ashanti or Burma? Disease takes the heart out of men in a way that mere death on the battlefield does not. I remember well how, in the end of 1898, the Wiltshire Regiment at Quetta lost so many men from enteric fever that recruiting was seriously affected in the home county. They lost about 60 men. I hardly think that the loss of 60 or even 600 men in action would have that effect. Hence we are justified in saying that losses from disease cannot be looked on in the same light as losses in action. Another difference is this. Once a bullet has killed or wounded a man the case is closed as far as that bullet goes. When a man sickens with enteric fever the case is by no means closed, either as regards himself or his comrades. Not only during his illness but for months, even for years, afterwards, long after he has recovered his health and returned to the ranks, he may still harbour in his body and disseminate amongst his comrades the germs of that disease. Thus, though, as I have already said, it may be just as necessary to lose men by disease as "in action" in order to defeat the enemy, it is still necessary to remember that the losses in the two cases cannot be looked at as of the same nature. Still, that is a matter for you to decide. Yours is the dominant profession, mine the ancillary. Your aim is to produce at the right time and place a force capable of defeating the enemy.

If I, as a sanitarian, can help you to increase the strength of that force, and at the same time impose no delay on your movements, I, as an ancillary, shall have achieved all the success that I can expect, and shall at the same time have justified my claim to recognition. To put it in other words, if sanitation can prove itself a positive factor in strategy, if it can show itself as a plus factor in the great equation, it will have a claim to recognition, but if it insists on being a negative factor it will inevitably and deservedly be ignored.

# Editorial.

THE resignation of Colonel[1] Bruce, who has held the Editorship of the Journal for the past four years, will be deeply regretted by all officers of the Corps. In his Editorial on assuming the Editorship in January, 1904, Colonel Bruce placed before us his ideas that the main functions of the Journal were to foster and strengthen habits of professional and scientific work, and how faithfully he has acted up to his ideals is known to all. His great scientific achievements have been an incentive to other workers, and, encouraged by his advice and sympathy, great advances have been made in the prevention of disease during his term of office. It is intended to continue the Journal on the same lines, for there is no doubt that the spirit of scientific investigation must be fostered if we are to keep abreast of the times and to maintain and improve our present position. As a scientific corps we shall be judged mainly by our work in the field of preventive medicine. Our opportunities are unequalled, and on foreign service we have practically unlimited material for investigation. Officers serving abroad, however, have great difficulty in obtaining access to works of reference, and often distrust their own observations. It is hoped that they will freely communicate their investigations to the Editor for reference to the Professors of the College, who are not only willing to give advice but take a great personal interest in all work performed by the officers of the Corps. Although research work has been given the first place in the functions of the Journal, the importance of clinical studies is not underrated ; the value of such work is beyond doubt, and its educational effect is fully appreciated. The medical arrangements of foreign armies, preparation of defence schemes, details of staff rides, &c., are also of great interest and importance, and the functions of the Journal would not be complete if such subjects did not receive due attention. It would appear, therefore, that if the Journal is to be of practical use to all of us, it must foster the spirit of research, encourage clinical studies, and assist in the spread of knowledge of administrative problems.

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[1] Now Sir David Bruce, to whom we offer our sincere congratulations.

# United Services Medical Society.

## REMARKS ON SOME RECENT THEORIES ON THE ACTION OF HEAT IN THE TROPICS.[1]

By Lieutenant-Colonel ANDREW DUNCAN.
*Indian Medical Service (R.).*

THE first enemy to health that an immigrant into the Tropics will meet with is the sun. The sun in certain regions will exert its malevolent influence all the year round; in others it will not, at certain periods of the year, it is true, be so insistent in those regions blessed with cold weather, but it will make up for this by a fiercer onslaught during the ensuing hot season. Take, for example, the Punjab, where we have, during the winter months, a delightful cold weather, to be followed by hot months of exceeding intensity. The problem how to counteract the effects of this heat is therefore a most important one, for should the newly-arrived officer in the East be once attacked by the sun at the outset of his career he will always be more liable to succeeding attacks.

In this paper I propose, in the first place, to draw attention to the latest and most successful method of warding off these effects of the rays of the sun, which does not seem, so far as I have experienced, to be as sufficiently known as it deserves to be. In the first place, what are the theories that have been held regarding sunstroke? As we all know, they are the following:—

(*a*) *The Caloric.* Here the symptoms are held to be due to the excessive action of heat on the body, the vasomotor and heat-regulating centres becoming deranged in consequence.

(*b*) *The Toxic.* Here a toxic agent is held to circulate in the blood, and to act as a poison on the nerve centres, particularly on the cells governing the heart and controlling the vasomotor apparatus.

(*c*) *The Microbic theory of Sambon.*

(*d*) *The Actinic theory.*

This latter, in my opinion, is the true one.

I must apologise for speaking somewhat largely of myself, but my experience has been gained "in corpore vili meo." In August, 1880, I landed in Bombay after a period of six months sick leave from Cabul, which I had spent in New Zealand. I returned to duty in the highest state of health, and was at once ordered again on Service, but this time on the Candahar line of operations. In a few days I found myself at Sibi, a place so hot that the natives thereof have a saying expressive of astonishment that the Deity troubled Himself to make Hell when He had already Sibi at hand. The rail in those days came to an abrupt termination in the sandy soil, and I remember well the heat, the greatest I had as yet experienced, felt whilst I was wending my way to the dak bungalow, about a quarter of a mile distant. About a week afterwards, when serving with the 8th Bengal Cavalry, I was attacked with sunstroke during some operations against a village, and after about eight weeks' treatment was once more invalided. Returning again to duty after two years' sick leave I was ordered to Mian Mir, in January, but in the succeeding March I was unfortunate enough to be again attacked with sunstroke, and went to Cashmere for six months, five months of which time elapsed before all symptoms disappeared. Between the expiration of this period and the year 1901, as each succeeding hot weather came round, I experienced distressing headache, more or less, although no definite attack of sunstroke occurred until the latter year. When serving with the Guides on the Black Mountain Expedition of that year, I once more incurred another attack necessitating a further period of two years' sick leave.

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[1] Paper read before the United Services Medical Society, on May 14, 1908, at the Royal Army Medical College, Millbank, the President, Inspector-General Sir Herbert Ellis, K.C.B., K.H.P., R.N., Director-General of the Medical Department of the Royal Navy, in the chair.

About eighteen months after my return from this period of sick-leave, I luckily one morning read in the *Pioneer*, a daily paper issued in India, a letter signed "Executive Engineer." This correspondent, whom, since my retirement, I have had the pleasure of meeting, and who is Colonel F. N. Maude, R.E., C.B., in this letter narrated now he had himself suffered from several attacks of sunstroke. Thinking over the matter he came to the conclusion that the dangerous rays of the sun were not the heat rays, but the actinic rays at the other end of the spectrum, which will practically pierce through anything except always a layer of colour, which acts as a filter. Colonel Maude stated that neither shape, material or thickness of helmet is any guarantee against sunstroke, and with this opinion I was well able to agree, as I had tried all the various helmets in use in India, such as the various shapes of solah topi, the Tuson helmet, &c. The best helmets in this respect, I may mention, I found were the Elwood helmet and the Cawnpore Tent Club helmet. Colonel Maude pointed out that no one becomes affected by heat when the luminous rays possess no degree of chemical energy, *e.g.*, in the furnace of an arsenal. The ultra-violet and violet rays can not only produce a superficial dermatitis with pigmentation of the skin, but can also affect chemical changes under the skin. He showed next how dark red or yellow will intercept the actinic rays, as every photographer knows. He therefore, so far back as 1885, began to use a red or yellow lining to his head-covering and coat, precisely for the same reason that a photographer develops plates by the aid of a red or yellow light. He found the resulting relief so great and surprising that he communicated his ideas to his brother officers, in every case with the happiest results. Colonel Maude finally submitted a report to headquarters at Simla. His Excellency the Commander-in-Chief tried the plan, and Lord Roberts stated that he found comfort under the Indian sun for the first time in all his long experience.

An experiment was next made with the troops. But unfortunately a mountain battery was somehow selected for the experiment—that is, a body of picked men, not especially liable to attack, as they were stationed in a hilly district. Moreover, at the time of the experiment, a new pattern of helmet had been issued of such bad workmanship that its issue was condemned by the Officer in Command, whose attention had also never been called to the question of the red lining at all. Such was the way in which the authorities were trying the value of Colonel Maude's theory. Not much was learned from this so-called experiment.

On reading this letter in the *Pioneer*, I at once adopted the method indicated. I lined my helmet with a piece of orange-red flannel. I wore a similar-coloured pad sewn into my khaki coat over the spinal column, and I wore an orange-coloured flannel shirt whenever I was on the line of march. I never afterwards once experienced any bad or distressing effects from the sun. Since my retirement from the Service, I have recommended the same procedure to patients who have consulted me for sunstroke, with, as far as I have been able to gather, similar results.

Lastly, in order to add force to the efficiency of this practice, I may narrate a remarkable circumstance told to me by Colonel Maude. Some time after he had promulgated the above views, he found himself living in the same bungalow with an officer who did not believe in his theory, and who one day surreptitiously abstracted the red lining from his helmet. Shortly after Colonel Maude had occasion to go out in the hot sun on some duty, and was again knocked over. On recovery he was naturally most annoyed to think that his theory was erroneous, until he was informed by the repentant officer of what he had done. It follows from these facts that the military helmet served out to soldiers should be invariably lined with red or orange-coloured material.

Before concluding this portion of my paper, I would like to draw attention to certain features of the three attacks experienced by myself, as I cannot find these features narrated in the text-books treating of sunstroke. The first feature was, that after the initial violent symptoms had passed off, I was tormented for from three to five months with the most excruciating pains in the head, coming on regularly as soon as the sun had risen, and lasting all the day until the sun had set. Nothing relieved them. Numerous drugs were tried; my head was shaved, blistered, and treated with ice applications, but to no avail. After the period mentioned, they gradually wore themselves out. The second feature to be noted was that I experienced at intervals for about eighteen months sudden attacks of distressing palpitation, accompanied with a feeling of impending dissolution. The intervals between the attacks at last lengthened, until they, too, finally disappeared.

There is another theory of sunstroke that has been brought forward by my colleague, Dr. Sambon, of the London School of Tropical Medicine. I would like to ask the members of this Society their opinion as to the validity of this ingenious theory. One naturally does not like to criticize adversely the views of a colleague; but according to the experience of India, this view would not seem to have a " leg to stand upon." Amongst the arguments in its favour, Sambon instances the *Geographical distribution of the affection*, stating that the endemic area is strictly limited, and that the affection prevails only in the lowest regions, in coast districts, or in the valleys of great rivers. Now this has never been my experience. I have never served in those regions ; all my experience of sunstroke has been gained in the Punjab and north-west frontier regions. My personal attacks were first in the Pishin Valley, 6,000 feet high ; at Mian Mir, 1,500 feet high ; in the Black Mountain, 3,000 or 4,000 feet high, and in Lahoul, 12,000 feet in altitude. Again, Major Cunningham, I.M.S., shows by reference to the official tables that the very lowest ratios for sunstroke are given by the Burma Coast, the Bay Island, and the West Coast—the lowest of the twelve geographical regions into which India is divided for purposes of medical statistics. Sambon also states that as regards the *meteorological conditions*, the affection does not especially coincide with the hottest days, that " Siriasis is not always found in the warmest region." But the before-mentioned tables show that the greatest mortality from heat-stroke exists in the Punjab, Sindh, and north-west frontiers, the hottest parts of India. He states that it occurs *mostly by night*, whereas most of my cases occurred by day; that the *suddenness of its onset* is an argument also analogous to the suddenness of onset of many infectious diseases. But this surely is no argument; one might just as well say cerebral apoplexy is a microbic disease. Again, with respect to the supposed microbe; it is true that a specific micro-organism has been described by Cagicol and Lapierre, but their observations have never been confirmed. Stiles, of Edinburgh, injected the blood of patients suffering from sunstroke into a healthy subject, without any reaction resulting, thus excluding the presence of any toxin. Lastly, according to the analogy of the specific infectious disease, if a man had once had an attack of sunstroke, surely he ought to be less liable to any subsequent attack. But just the opposite result obtains in sunstroke ; if a man once has an attack, he is for ever afterwards more liable to subsequent attacks. For these reasons I am certain that as regards India the microbe theory will not hold water. It may be valid for any hot region of which Dr. Sambon has personal experience, but certainly not for India.

So much for one of the general effects of the sun, and the microbic theory of Sambon. I now wish to allude to the most recent view concerning one of the local effects, namely, prickly heat. This, although a minor ill, and also one popularly supposed to confer a benefit on the individual experiencing it, is surely one of the most exasperating affections to which the sojourner in the Tropics is exposed; and any means found to alleviate it by experience must be most gratifying both to patient and medical attendant.

Until comparatively recently, the view that the sweat glands were primarily implicated was held by pathologists; there was said to be an obstruction of the sweat glands, with or without inflammation as a cause or consequence. But Dr. R. Pearse, of Bombay, dissents from that view. According to him the sebaceous glands are primarily at fault, and he is of opinion that there is at first an acute obstruction of the sebaceous glands by their own secretion, which then is secondarily maintained by the continued irritation imparted by excessive perspiration. He points out that prickly heat is distinctly limited to those parts of the skin containing sebaceous follicles. His treatment, which certainly seems to be more successful than the usual methods employed, is based on this view.

Dr. Pearse recommends the following line of treatment. It will not, he says, cure, for if you leave it off for a day or two, the affection returns; but where it is applied regularly it has been found to give the greatest relief. The patient is directed to anoint his or her body with an oily preparation, to protect it from the secondary irritation of the exuded sweat. A mixture of almond oil and lanoline, in the proportion of eight to one, with some oil of rose, is recommended by Pearse.

Major Moore, R.A.M.C., has used with great efficacy fresh cocoanut oil. Most people living in the Tropics look upon cocoanut oil as a nasty product, but if fresh it has only a very faint odour, which disappears when it is rubbed into the skin. The best time to apply it is before taking one's evening exercise. You strip, pour a little of the oil into the palm of your hand, and rub it over the body from the neck to the ankles, getting your servant to rub the back. Do not use a sponge, as it is not easily cleaned, and soon gets offensive. It is recommended also to avoid using soap, as the latter removes the sebaceous matter from the surface of the skin, and the sebaceous glands are thus unduly stimulated to produce more secretion, whilst at the same time the excessive perspiration is also irritating them to lubricate the surface. As a further aid, dusting powder is very valuable, and when no other is handy, fine Indian corn meal can with advantage be so used.

Major Pearse recommends also wearing cotton next the skin, and mentions an open-work cotton. I cannot speak with experience of this method of treating prickly heat, as it was advocated after I had left India, but from the accounts at hand of its success, it would seem to be advisable, and also planned on the right tints. I am, however, sceptical of the advice to wear cotton next the skin. Surely this would be harmful; it becomes sodden with perspiration, and there are in addition all the other disadvantages of cotton in the Tropics, such as the greater liability to get chilled, and the less permeability to air—so necessary for the healthy interchange of gases, and a healthy atmosphere around the body.

Lastly, I may mention what I have found the best alleviating remedy for prickly heat. I tried numerous methods, but the one that relieved me most of the excessive irritation was bathing the irritated parts with water to which "washing soda" had been added.

## DISCUSSION.

In the discussion which followed, many interesting descriptions of cases of sunstroke and heatstroke were given, several officers relating their own experiences when affected.

The theories regarding sunstroke were criticised; all received a certain amount of support, but the actinic theory was generally adopted. Eloquent testimony was given as to the value of red or orange linings for the head-dress, and the wearing of a garment of the nature of a singlet and spinal pad, both coloured red, was highly recommended. It was stated that with the old pattern red uniform the sun was much less powerful for harm than it is with the modern dress.

Sunstroke and heatstroke were regarded as distinct diseases.

On the subject of cotton underclothing it was pointed out that Indian cotton was absorbent, and that while the twill lining of India was comfortable and safe, a garment of English manufacture was unsuitable.

Lieutenant-Colonel Sir R. Havelock Charles, K.C.V.O., I.M.S., Colonel Maude, R.E., Major W. S. Harrison, R.A.M.C., Captain Douglas, R.A.M.C., Lieutenant-Colonel C. H. Melville, R.A.M.C., Lieutenant-Colonel W. G. Macpherson, C.M.G., R.A.M.C., and the President, joined in the discussion.

Lieutenant-Colonel Duncan replied, and a hearty vote of thanks was accorded to him on the motion of the President.

# Clinical and other Notes.

## THE BOMBAY MEDICAL CONGRESS, 1909.

We would wish to draw the attention of our readers to the notice of the Medical Congress to be held in Bombay in February, 1909, on p. 15, of the current issue of the Corps News.

The Central Committee consists of representatives of the different branches of the medical profession, and the Congress will be held under the Presidentship of His Excellency the Governor of Bombay, among the Vice-Presidents being the members of his Council, the Director-General of the Indian Medical Service, the Principal Medical Officer His Majesty's Forces in India, &c. Lieutenant-Colonel W. E. Jennings, I.M.S., is the General Secretary (and Editor of the Transactions).

Tropical medicine, surgery, hygiene and parasitology form the greater part of the subjects to be considered.

Admission to all members of the medical profession will be free, subject to certain restrictions, but medical subscribers of 10 rupees or over will be entitled to admission unconditionally, while those of 15 rupees or over will have their names registered as well for a free copy of the Transactions (which would otherwise have to be bought).

The session will extend over four days, and the subjects will be considered in six sections.

## THE CARE OF THE FEET IN THE GERMAN ARMY

By Captain C. R. SYLVESTER BRADLEY.
*Royal Army Medical Corps.*

In a former article[1] I endeavoured to point out the methods adopted in the American Army to ensure efficiency with regard to their soldiers' feet. The present article deals with the care of the feet in the large conscripted German Army, in which the men serve for a definite short period, discipline is very severe, the pay extremely small, and in which no inducement is needed as in non-conscripted armies to make men enlist. The definite conditions which prevail between a conscripted army and a highly paid non-conscripted army is strongly evidenced by the allotment of boots to recruits during their first year's service. The American recruit gets eight pairs of boots; the German one pair of Wellingtons and one pair of canvas boots. The former recruit is supplied with the best boots that money and skill can supply, whilst the latter is lucky if he has not to be content with a "second-hand" pair of Wellingtons, fitting none too well.

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[1] Journal of the Royal Army Medical Corps, November, 1907.

The arrangement for the supply of boots in the German Army is done regimentally, the boots being made in the regimental bootmakers' shop by "skilled bootmakers." These men are professional bootmakers when they join the army, and work in the bootmakers' shop during the whole of their service, only having to go through their "preliminary training" and an annual course of musketry. There are also company bootmakers, whose duty is to repair the boots of the men in their own company; these men are struck off "guards" and "fatigues," but otherwise have to perform their ordinary military duties, and are taken out into camp and on manœuvres, &c. All minor repairs have to be paid for by the men themselves, but new soles may be obtained from the regimental store, and are "put on" by the company bootmakers.

The issue of boots to the recruit is, as I have remarked above, Wellingtons, or *lange stiefel*, one pair; canvas, or *schnürschuhe*, one pair. The Wellingtons are of black calf skin with wide uppers, into which the trousers can be "tucked," and the soles are hob-nailed; these boots are supposed to last one and a quarter years, but are often made to last much longer. The "canvas shoes" resemble canvas laced English tennis boots with leather soles, which must last one and a half years.

There is no issue of socks or other protection for the feet, each recruit supplying his own, and continuing to keep himself supplied out of his pay.

From the above description it is easy to imagine how very inferior the "foot-gear" of the German soldier really is, and one would naturally expect to find them correspondingly "poor marchers"; but this is not so, for they are well up to the average of the modern European infantry soldier. It is the maintenance of this standard of efficiency with inferior equipment that is so interesting to investigate. There is no system of regimental or company chiropodist in the German Army, so that efficient results have to be attained solely by (1) individual effort on the part of the soldier; (2) taking full advantage of the regimental and company bootmakers; (3) constant supervision of the feet by company officers, medical officers and N.C.O.'s; (4) deterrent punishment in case of neglect.

The disadvantage of "Wellington boots" to march in are many, the chief ones being their liability to slip and rub at the heel unless they are made so tight that they pinch at the instep; no support is afforded to the ankle, and when marching in wet weather or wading through streams they are apt to fill with water, which has no means of escape.

As there is no provision of socks regimentally, the German soldier has been forced to find the best means of protecting his feet with as little drain on his pay as possible, and the outcome of this is the square piece of rag, or *fusslappen*, in which they wrap their feet much in the same way as a triangular "foot-bandage" is applied. This form of protection is cheap, easily renewable, and when properly applied can be made to overcome many individual peculiarities of foot or boots. It is a common practice to keep the *fusslappen* oiled or greased ; and another not generally known practice amongst men who suffer from easily blistered or "fired" feet, is to first wrap their feet in an old piece of newspaper. I have never tried this myself, but was told by an old soldier that as soon as the paper had got warm and accommodated itself to the shape of the foot it was most comforting and effectual.

The boots are kept thoroughly oiled or greased, and are only polished for church and other big parades.

The system of company bootmakers is decidedly sound, as minor repairs or alterations can be executed on the march, but the great secret of success is the personal supervision by company officers, medical officers, and N.C.O.'s, the feet and boots of all men being inspected daily, and daily washing of the feet being strictly enforced. A dusting powder of salicylic acid, starch and French chalk for hardening the feet is constantly used on the march, and also in barracks, while formalin in powder and liquid form is also provided.

There is no specified punishment for a man who falls out with sore feet, but should the company officer consider the soreness due to neglect in the repair of his boots, washing his feet, applying dusting powder, &c., he may and does punish him, with most excellent results.

## THE SANITATION OF STANDING CAMPS IN INDIA.

By Lieutenant-Colonel F. W. CATON JONES.
*Royal Army Medical Corps.*

The following notes are supplementary to those on Indian sanitation already published in the Journal for January, 1907.

We have all, I am sure, been depressed by the very insanitary condition into which camps get after being occupied for a short time. This, too, in spite of all the instructions in the little red books.

Being a "Fly Maniac," I judge of the result of our efforts, and gauge our peril, by the number of flies present. Flies are the camp warning signal of enteric fever danger. But please note that the "Fly Maniacs" do not relax any precautions against water infection. They are as keen on that as their brethren of the "water only" school. But they recognise both dangers.

In making recommendations, the first consideration out here is one of expense, but much can be done at little cost. A sharp outbreak of cholera in the 117th Mahrattas in October last made us think out a system of disposal of excreta in camp by which flies would not be attracted or bred. Lieutenant M. F. Reaney, I.M.S., and myself elaborated a plan which was most thoroughly carried out by the officer commanding and his officers, who took great interest in the work.

This plan we determined to try in our winter camp. The various camps were occupied from a fortnight to two months continuously. The winter in the Central Provinces is mild, and flies swarm in and close to villages.

The following were the instructions given:—

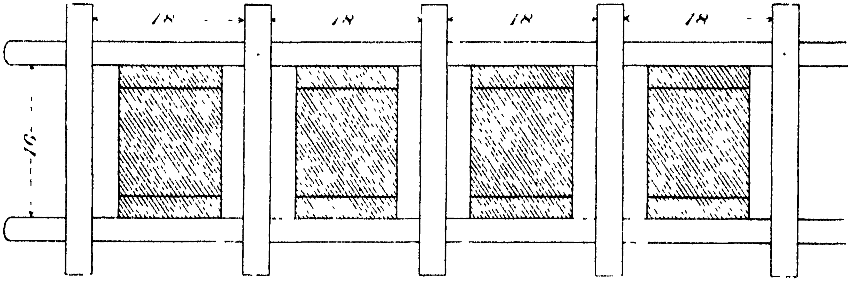


Diagram of bamboo frame work seen from above with kerosine oil tins in position.

### ADDITIONAL SANITARY RECOMMENDATIONS FOR STANDING CAMPS.

*Latrines, European.*—Twenty feet total length.

Seats for 10 per cent. of troops should be provided. Seats of bamboo similar to above should be made beforehand. The ends and centre rest on sand-bags. These must be high enough to raise the framework above the receptacles. These receptacles should be kerosine tins with one side evenly cut off lengthways. The tins should be tarred inside.

Before use, crude carbolic acid lotion (1—20) should be put in each tin to a depth of 2 inches and replaced as often as necessary. When half full the tins should be emptied into the ordinary latrine receptacles. Two of these should do for every twenty seats or perhaps more. These receptacles should be kept close to the latrine. The kerosine tin should be washed with a little carbolic lotion (1—20) over the receptacles and put back in its place with 2 inches of lotion in it.

The kerosine tins and the receptacles should be pesterined outside daily. Kerosining is not enough as the oil rapidly evaporates. When a receptacle is nearly full it should be carried (hung on a pole if necessary) to trenches dug close to (not more than 60 yards away from) the latrine.

For an ordinary receptacle, capacity 9 gallons, a trench 6 feet long by 2 feet broad by 1 foot deep will suffice.

At least a sufficient number of trenches for a day and a half (and better for two days) should be dug in advance by the troops. The earth taken out should be pulverised.

In black cotton soil this cannot be done efficiently until the earth taken out has been exposed to the sun for a day. Hence the necessity for two days trenches in advance in such soil.

Before a receptacle is emptied into its trench, a layer of pulverised earth to a depth of 2 inches should be thrown evenly into the bottom of the trench. The receptacle is then emptied into the trench, fouling of surrounding ground being carefully avoided.

some of the dry pulverised earth is thrown into the receptacle to give it an earth washing. The inside of the receptacle is then washed with a little water.

These washings must be done over the trench. The clean receptacle is then taken back to the latrine. The disused trowels from barrack latrines would be useful in the earth washing.

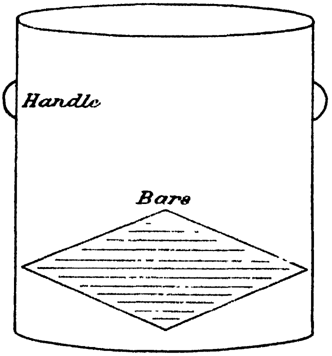
The dry pulverised earth from the trench is then *evenly* thrown over the filth until the trench has been more than filled up.

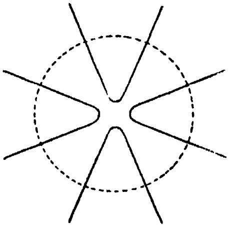
One of the trained sanitary supervisers should constantly be on duty at the latrines in the daytime, and supervise the work.

The presence of flies prove that the work is not being properly done.

*Native Latrines.*—Similar to above, the kerosine tins being cut lengthways and placed between stones or a small bank of earth, or sunk in small pits.

*Urinals for Europeans and Natives.*—Kerosine earth urinals, if properly made and "policed," may be dug in the lines (not near wells). A cube of earth (3 feet) must be dug out. The earth taken out should be pulverised if possible, if not the pit must be filled with powdered earth or sand brought from some place near. The pit is filled to within 4 inches of the top and the surface is kerosined freely twice daily. The earth in such a pit should be free from smell for at least ten days, and possibly a fortnight. After a fortnight, or sooner if it smells, the earth must be taken out and buried, and fresh powdered earth put in and treated as above.





*Cookhouses.*—Sullage pits 4 feet deep 4 feet wide and 6 feet long should be dug for each company cooking place. The earth at the bottom should be loosened for 6 inches more. On bamboos over this pit kerosine tins, cut lengthways, and with nail-holes in the bottom to form a sieve, should be placed. All liquid cook-house refuse should be poured into these perforated tins. The water runs into the pit and the solids are caught in the tin. When necessary the solids in these tins are to be emptied into the incinerator. The sullage pits should be kerosined twice daily.

*Refuse.*—Refuse should be burnt in an incinerator. As an experiment a portable incinerator is being made, a hollow iron cylinder 4 feet long and 4 feet in diameter, with iron bars 1 inch apart let in from the bottom, also a handle on each side. The cylinder will be placed over a trench like a field cooking trench, the grating end being nearest the ground.

The result was that the camps were the cleanest I have ever seen. There were no flies at the latrines or trenching grounds, hardly any flies at the sullage pits, and one saw no refuse lying about the camp. The men were only too glad to be able to throw refuse and garbage at once into the incinerators. There were two of these. One round, as in the illustration, and one square. The latter was made to fold up, but the square sides did not answer quite as well as the round. The refuse was not so easily burnt. The incinerators, however, burnt everything. Tins full of wet tea-leaves, potatoes, bones, &c., &c., were emptied in straight from the sullage pits. The ashes and calcined bones, being harmless, were thrown into a nullah close by.

The sullage pits answered very well in suitable soil, and even in black cotton soil were not a nuisance when kerosined. But these last had to be filled in oftener than those in porous soil.

I am of opinion that a portable, round incinerator, 4 feet in height and 3½ feet in diameter, would suffice for 200 men. Four would be required for a battalion of infantry. I am having three small doors made in the incinerator, at equal distances, just above the grating, so as to be able to have one open to admit the prevailing wind.

The Royal Field Artillery preferred two poles as seats for their latrines ; one to sit on and one as a back-rest. They answered very well. The kerosine tins were placed just behind the sitting pole.

This system could easily be carried out at permanent and semi-permanent posts on the lines of communication on service (and even sometimes in camps occupied for some days). Tins of sorts for receptacles are always available. The trenches would be dug by each party of men going through, and so be ready for the excreta of the next.

An incinerator could easily be built with mud and scrap iron at each post. By following this plan, I am sure that *Bacillus typhosus* would not find a breeding ground at posts, and these would not be, as they now are, centres for the distribution of enteric and other filth diseases.

The kerosine urinals answered admirably. No claim for originality is made for the system detailed above. It is the result of the experience and recommendations of many authorities, brought into working form for standing camps. The system could not have been carried out efficiently without the hearty co-operation of the commanding and company officers concerned.

## A CASE OF SPONTANEOUS RUPTURE OF THE SPLEEN.

By Lieutenant E. G. R. LITHGOW.

*Royal Army Medical Corps.*

Private A., 1st West Yorkshire Regiment, was admitted, on December 26th, 1907, to the Station Hospital, Rawal Pindi, suffering from anuria and abdominal pain.

*History of Illness.*—On the day previous to admission, patient complained of colicky pains in the abdomen and fainting fits. He stated that he had frequently had attacks of malaria, originally contracted in Mian-Mir. He reported sick and was sent over to the Station Hospital from the Section Hospital at West Ridge.

*On admission*, patient was extremely drowsy, and complained that the pain in the abdomen had become worse. He was unable to pass urine, and was very anæmic and cachectic. Pulse 120; respirations 30; temperature 96·4° F. There was tumidity over the lower half of the abdomen, and rigidity was well marked on palpation. Pain was complained of over the spleen, which was enlarged. Tongue rather dry and furred; breath smelling strongly of urea. A blood smear was taken, and benign tertian parasites found on examination. Two ounces of urine were drawn off by catheter. No albumin was present. A diuretic mixture, 6 grains of calomel, an intramuscular injection of 15 grains of quinine, and fomentations locally to abdomen, were given. Plain milk was ordered. Next day the patient's condition had somewhat improved, he was not so drowsy, and the tumidity of the abdomen was less. No urine had been passed during the night; pulse 108; temperature subnormal. A turpentine enema containing asafœtida brought about a satisfactory action of the bowels; motions were formed and offensive. As the tympanites was thought to be due to a paresis of the large intestine, 5 minims of liquor strychninæ were administered, given hypodermically, to stimulate the bowel, and repeated after an interval of two hours. Two ounces of urine were drawn off in the evening. An intramuscular injection of 15 grains of quinine was again given.

On December 20th patient was placed in a vapour bath; skin acted fairly well. Colonel O'Sullivan, A.M.S., and Captain Turner, R.A.M.C., kindly saw the case with me, and the possibility of a ruptured spleen, or of internal hæmorrhage from other sources, was discussed with a view to operation. The consensus of opinion was in favour of a malignant type of malaria.

On the morning of the 29th the pulse-rate fell to 60. The temperature remained subnormal. Drowsiness was well marked and patient's condition very apathetic. Only 3 ounces of urine had been passed during the previous twenty-four hours, which, on examination, contained albumin to the extent of one-third. Patient was again placed in a vapour bath, and a third of a grain of pilocarpine nitrate given hypodermically. At this time the pulse-rate was 40, and a strong smell of urea emanated from the patient. The vapour bath was given for a little over half an hour, during which time the skin acted but feebly. Subsequently the pulse was barely perceptible at the wrist; 5 minims of liquor strychnine were given hypodermically, and the transfusion apparatus requisitioned for. Patient rallied for a little, but shortly after again relapsed into a comatose condition, and when seen at 2 p.m. he had a uræmic convulsion. His condition gradually became worse, death taking place at 3 p.m.

A *post-mortem* examination was made on December 30th. The body was that of a fairly nourished young man. *Post-mortem* lividity was well marked. On opening the abdominal cavity the small and large intestines were found to be distended, and there were dark blood-clots present in considerable quantities in the peritoneal cavity. The blood had obviously escaped from a rent about 1½ inches wide in the capsule of the spleen. This organ was enlarged, and weighed 15 ounces. The splenic capsule was considerably thickened. A longitudinal section showed the spleen substance very much compressed, and surrounded by clotted blood which formed a well-defined layer about 1 inch thick beneath the capsule.

The right kidney weighed only 1 ounce; left kidney weighed 2 ounces; both were fibrous and were typical examples of "small white kidney." The other organs were normal.

*Cause of Death.*—The patient had suffered a good deal from malaria. No history of any injury was obtainable. It would appear from the above facts and symptoms that an intra-capsular hæmorrhage had taken place spontaneously, and that up to a certain point the already thickened capsule was able to resist the pressure from within. Ultimately the capsule had given way, allowing blood to escape into the peritoneal cavity. The anuria was probably due to two factors, viz., the extremely fibrotic and diseased condition of the kidneys, and to the considerable and progressive hæmorrhage.

## SPREAD OF ENTERIC FEVER BY WASH-DOWN CLOSETS

By Captain S. de C. O'GRADY.

*Royal Army Medical Corps.*

Now that the importance of actual contact is becoming more appreciated, as a means by which enteric fever is spread, I think that a very dangerous source of infection is to be found in the wash-down closets which are coming into use so much in barracks. Firstly, on dropping into the pan some material of the size and consistency of a mass of excreta, drops of water are seen to fly up in all directions against the under-surface of the seat, and to appear above the level of the central aperture. This is a most filthy and dangerous condition of things. Again, it is the rule rather than the exception to find a similar state of things occurring on pulling the handle of the "sanitary engine." This is obviously a means by which many fatal diseases can, and probably are, conveyed from person to person.

## SOME FURTHER NOTES ON DIETING IN STATION HOSPITALS IN INDIA.

By Lieutenant-Colonel H. CARR.

*Royal Army Medical Corps.*

Every medical officer commanding a Station Hospital in India will, I think, acknowledge the value of a recent article by Colonel O'Keefe on the subject of improvements in the dietary[1] and dining arrangements of hospitals in India, and I propose in this paper to give my experiences in attempting to carry out somewhat similar ideas; but as a preface I wish to emphasise the fact that I am not writing for the benefit of those happy individuals who have been selected to administer hospitals in "show" cantonments, housed in modern buildings, and who only have to ask that it may be given, but in order that I may compare notes with the vast majority, who, like myself, are endeavouring to run a hospital according to the modern demands for comfort and culinary refinement in a building with kitchen and equipment on a pre-mutiny scale.

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[1] Journal of the Royal Army Medical Corps, January, 1908.

It will be conceded, I hope, by every medical officer that a patient, convalescent from an acute illness, and a healthy man in hospital for, say, some minor surgical affection, require to have the regulation convalescent diet supplemented by some extras, more especially at breakfast and tea, and it is in recognition of this want and in an endeavour to introduce uniformity into these supplemental issues, that the appended diet-table has been compiled.

The most obvious defects in the old system of sending up to the wards each diet in a separate vessel were: (1) The waste in dividing, weighing, and cooking each portion separately; (2) the absolute impossibility of serving a meal hot; (3) the waste of material such as bread, salt, butter and milk, when for some reason or other not consumed by the individual to whom issued; (4) the extremely objectionable practice of keeping food in the wards, especially bread, butter and milk.

To minimise and, if possible, eradicate these defects, the following steps have been taken: (*a*) A suitable room is provided as a dining hall; (*b*) each patient who is fit is marked "D.H." and put on a convalescent diet, which automatically carries extras as per diet-table, and takes all his meals in the hall; a copy of the diet-table is hung in each ward, and supplied to each assistant-surgeon who compiles diet requisitions. By these means it is ensured that a sufficient number of men are each day on the same diet, to enable a joint to be roasted, or otherwise prepared, and puddings to be cooked in bulk, instead of in separate dishes. (*c*) The food of all such patients is taken over by the senior assistant-surgeon, who arranges for the joint, &c., with the cook "told off" for the dining-hall, and hands the groceries and extras to the patient detailed to keep them in a locked safe, and who issues them as required. (*d*) A hot case has been provided such as is in general use in private houses in India, and all plates, basins, &c., are thoroughly heated in it prior to the dinner bell being rung. The joint and puddings having been carried over from the kitchens in the vessels in which they were cooked, are carved on a side table, and served on hot plates to the men sitting at table.

This system is now working here quite smoothly, and is well liked by the men. So far there has been no hitch or dispute, as was thought possible owing to uneven distribution of the joint. The carving is done by the cook. In addition to the above advantages, by keeping control of the extras and cooking in bulk a considerable saving of bread, butter and milk is effected, out of which bread puddings, "French toast," or some other kind of sweet can be made, and given for supper without any extra expense.

The following difficulties were encountered by me in effecting a start: (1) No room in the hospital set apart for dining. Overcome by appropriating a ward which could be spared owing to low sick rate. (2) No dining-room kit, such as large dishes for serving joints, carving knives and forks, vegetable dishes, hot case, &c. All these had to be privately purchased. (3) No proper oven for roasting, no baking dishes, or, in fact, any kitchen equipment beyond flanders kettle. These had to be improvised and purchased. A new kitchen has been on the list of major works for years, and will, I expect, be built when the new mobilisation and distribution scheme is complete. (4) The want of education and initiative in the Army Hospital Corps cook, who, as a rule, is a low caste man, and devoid of all ambition to get beyond the regulation roast and boil. This can only be overcome by personal supervision, and I am trying the experiment of taking one of the most intelligent of the cooks into my own kitchen, where he works under a really good cook and sees how a dinner ought to be cooked, sauces made, and, what is more important, especially with sick officers, how dishes are served and prepared for table. I am of opinion that one month of such work will teach a man more than three at a cookery class, where for the most part the native stokes the fire for the soldier to use. (5) There was a little hitch at first regarding the rule that all crockery of men marked "D.H." was to be kept in the dining-room, as a man when first admitted is almost invariably put on milk, and patients, especially those suffering from malaria, are subject to sudden relapses. This was overcome by leaving a fixed equipment of crockery in the charge of the dining-room attendant and letting each man draw his own crockery according to regulations not to be removed from the ward, thereby obviating all danger of breakage in transit to and fro. This, of course, can only be done when the number in hospital is well below the number of beds equipped.

The following establishment was told off to the dining-room and held responsible for its proper state: one cook, one ward servant, and one *bhistie*, which establishment kept the crockery washed up after meals, and waited at table.

The diet-table can, of course, be varied from time to time, the only essential being that the same diet is drawn for a sufficient number on any one day.

In this part of India there is very little fat on the mutton, and the best roast is a sirloin of beef, which allows a saving of the ounce of butter allowed for each diet to be made for subsequent pudding-making and bread frying, &c.

My diet-table is not based on any scientific foundation and doubtless can easily be proved excessive by a physiologist, but I have forgotten how to reduce it to water-free food, and show its potential energy in foot tons, and as the only member of my staff who has had the advantage of a refresher course at the Royal Army Medical College is a specialist in mental disease, I must risk the expert criticism ; but before condemning it, I would ask the critic to breakfast at eight on tea, bread and butter, dine at one on 10 ounces of meat, and sup at five on tea and bread, without butter if his appetite at breakfast was healthy.

As will be gathered from the above notes, it is impossible to run a scheme like this without incurring some initial outlay, but in my case I experienced no difficulty in obtaining the necessary funds from the various corps in the station.

In conclusion, I express a hope that I may not be considered to have gone into unnecessary detail, as it is on such little trifles as a hot plate, or an ounce of butter saved, that such schemes must stand or fall.

### STATION HOSPITAL, NASIRABAD.

Patients placed on *Convalescent Roast Diet* will take all their meals in the *Dining Hall*, and will receive the following Extras, which will be accounted for one day in advance.

| | |
|---|---|
| Mondays, Wednesdays, Fridays, and Sundays | Butter 1 oz., Oatmeal 2 oz., Sugar 1 oz., Milk 10 oz., Jam 2 oz., Custard Pudding. |
| Tuesdays, Thursdays, and Saturdays | Buttor 1 oz., Eggs 2, Cheese 2 oz., Rice Pudding. |

*Breakfast.*

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| Bread | Bread | Bread | Bread | Bread | Bread | Bread. |
| Butter | Butter | Butter | Butter | Butter | Butter | Butter. |
| Tea | Eggs | Tea | Eggs | Tea | Eggs | Tea. |
| Oatmeal | Tea | Oatmeal | Tea | Oatmeal | Tea | Oatmeal. |
| Sugar | | Sugar | | Sugar | | Sugar. |
| Milk | | Milk | | Milk | | Milk. |

*Dinner.*

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| [1] Meat, roast | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. |
| Potatoes | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. |
| Vegetables | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. |
| Pudding | Ditto | Ditto | Ditto | Ditto | Ditto | Ditto. |
| Custard | Rice | Custard | Rice | Custard | Rice | Custard. |

*Tea.*

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| Bread | Bread | Bread | Bread | Bread | Bread | Bread. |
| Butter | Butter | Butter | Butter | Butter | Butter | Butter. |
| Jam | Cheese | Jam | Cheese | Jam | Cheese | Jam. |
| Tea | Tea | Tea | Tea | Tea | Tea | Tea. |

[1] To be varied according to the description of the beef or mutton supplied.

## TWO CASES OF PTOMAINE POISONING.

By Lieutenant-Colonel R. J. A. DURANT.
*Royal Army Medical Corps.*

Case 1.—Corporal H. was brought to hospital on June 29th, 1905, at 7 a.m., suffering from vomiting and diarrhœa and great muscular weakness. He stated that at 8.30 the previous evening he had eaten some potted meat in the regimental coffee bar, and at 10.30 p.m. he felt colicky pains in the abdomen and passed two motions, after which he was easier and went to sleep. He woke at 6 in the morning feeling sick, vomited some dark, sour fluid, and passed two loose dark motions. He attempted to go on parade, but collapsed, and was then carried to hospital.

On admission he complained of giddiness, his skin felt cold and was clammy with sweat, gait tottering, pains felt in chest, back, and over epigastrium. Pulse 100, and weak; respiration 40, shallow; tongue covered with white fur; temperature 97·6° F. He vomited soon after admission some pieces of meat mixed with mucus, and he passed two or three stools, dark in colour, very offensive, containing scybala, mucus, and shreds of meat. The patient complained of great thirst and weakness, and did not improve under treatment. His pulse became quicker and weaker, and the temperature rose to 100° F. by midday. Vomiting was not controlled until midday. Gradually the cardiac action became weaker, he was exceedingly restless, and died at 10.30 p.m., completely cyanosed, from cardiac failure.

*Post-mortem examination.*—The heart was found to have some hypertrophy of the left ventricle, but no valvular lesion. The liver was cirrhotic. The stomach had fifteen round-shaped congested patches in the mucous membrane, each about the size of a three-penny piece, and there were no ulcers. In the intestines there were numerous patches of congestion of the mucous membrane, oval in shape, varying from 1 to 2 inches in length. These were all in the ileum and jejunum.

Case 2.—I was sent for at 7.45 a.m. on March 24th, 1908, to see Captain G., and went at once. On arrival I found him suffering from convulsive flexions of the hands, fingers and toes. The patient was greatly prostrated and the skin clammy and perspiring; temperature 97·4° F.; pulse 104, and weak. I was informed he had been to a Calcutta hotel on Sunday, the 22nd, and had eaten ham, stewed tinned peaches and tinned green peas. He had not felt quite well since that day; feeling languid, with complete anorexia and nausea.

At 6.30 a.m., on the morning of the 24th, he woke up with pain, referred to between the shoulders and in the chest, extending to the region of the stomach. Soon after he had diarrhœa, passing four stools of a dark colour, very offensive and containing mucus and pieces of meat. He also vomited up some sour fluid and pieces of meat. The diarrhœa stopped shortly before 8 a.m. At 8.15 he vomited some yellow, acid, bile-stained fluid. A few spasms of the muscles of the calves occurred, but not of any great severity. The grave symptom was cardiac weakness, which was marked all through his illness. By 9.15 a.m. all spasms ceased, when the temperature began to gradually rise, reaching 100° F. by midday. The pulse became weaker, until it was imperceptible, the patient became cyanosed, and he died at 1.40 p.m. from cardiac failure. He retained consciousness up to within five minutes of death.

*Post-mortem* examination was objected to. The cause of the poisoning was probably the ham he had eaten on Sunday, the 22nd, and the incubation period was therefore about thirty-six hours. The symptoms lasted seven hours, and all diarrhœa and vomiting stopped five hours before death.

*Remarks.*—These were cases of acute gastro-enteritis, and such cases can be set up by unsuitable ingesta, such as sausages, meat-pies, shell-fish, or food in a state of decomposition. The pathology of such cases requires much investigation. On looking up the literature of this subject I find it stated that:—

(1) A spirillum (spirillum of Finkler-Prior) has been found in some cases, and it is probable that a virulent form of *Bacillus enteritidis sporogenes* is responsible for some cases of meat and milk poisoning. (2) Similar attacks have been produced by ham. The precise nature of the kreotoxicons has not yet been determined. (3) In the majority of these cases the meat has undergone decomposition, though the change may not have been evident to the taste. The mildest cases have usually the following symptoms: colicky pains, vomiting, diarrhœa, thirst, headache and muscular weakness. Such a case occurred here in 1906 and was traced to a tin of fish, which had been obtained from the regimental coffee shop, the contents of which were eaten the previous evening. Fortunately, some of the fish was left in the tin, and was brought up for inspection by the patient. A bacteriological examination was made and *Staphylococcus, aureus* and *albus*, spore-forming bacilli, and other bacilli, were found, but no Gaertner's or colon bacilli. Similarly, cases of diarrhœa occurring here in 1907 were traced to infected Bombay butter sold in the coffee shop. In this butter colon bacilli were found, but no typhoid or dysenteric bacilli. Some observers have found large numbers of streptococci in the stools, others say there is no specific micro-organism. It seems likely that the house-fly as carrier is the essential cause, and according to the opinion of some authorities, "In the form of egg or larvæ or newly hatched insect the house-fly resides in the superficial layers of the earth or in some deposit of organic matter, where it is intimately associated with various pathogenic bacteria; when able to fly it can settle on food and deposit bacteria which set up diarrhœa."

Some hold that "heat" alone, apart from the growth of bacteria, causes diarrhœa, by depressing the nervous system, particularly the vaso motor system, and partly also by interfering with digestion, so that bacteria easily multiply in the intestines. It is supposed that a bacterial, or bacteric, chemical change in the food takes place, forming so-called ptomaines (alkaloids), which give rise to the poisonous symptoms.

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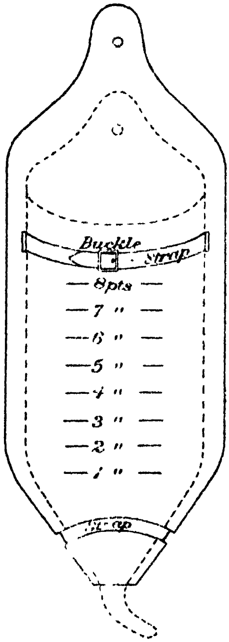
## BRACKET FOR IRRIGATORS USED IN VENEREAL WARDS.

By Lieutenant-Colonel J. A. B. DALY, C.B.
*Royal Army Medical Corps.*



Bracket for irrigators used in venereal wards, front view. Width of board, 9 inches, length of board, 2 feet. Dotted line represents irrigator.

Owing to the fact that the weight of the irrigator with its contents amounts to nearly 16 lb., and that the whole of this weight is concentrated upon the small portion of glass above the nail supporting the irrigator, breakages are extremely common.

At my suggestion a movable bracket of soft deal (as shown in the illustration) has been devised by No. 8564 Staff-Serjeant G. A. Howell, R.A.M.C., for obviating the damage which these irrigators have hitherto sustained, even when the utmost care has been exercised in their management. The dimensions are given, and the design can easily be understood from the diagram. The weight of the irrigator and its contents falls upon the two straps shown in the diagram. The nail, of course, supports the whole arrangement without coming into contact with the glass at all.

Since this device has been in use in the Military Hospital, Curragh, not only have no further breakages occurred, but even irrigators broken, by being employed in the old way, have been used in the new way as effectively as unbroken irrigators. I wish to bring this device of Staff-Serjeant Howell to the notice of my brother officers, as I have not the slightest doubt the plan will be found most effective in saving expense to the public and the individual.

## AN ARTIFICIALLY PRODUCED CARDIAC BRUIT.

By Captain N. E. HARDING.

*Royal Army Medical Corps.*

Having had to examine a considerable number of hearts during the past few days, I have found two in which a well-marked aortic systolic bruit was produced by merely standing with the shoulders thrown back, *i.e.*, when holding up the shirt so that I could auscultate the various areas. With the arms hanging by the side both sounds were quite normal and the bruit could not be made to appear by exercise, though as soon as the shoulders were thrown back it at once became audible, to disappear again when the arms were let fall. Both men seemed perfectly healthy and were considered by another officer and myself to be quite fit for all duty, including "khud-climbing." Is it possible that we have here the secret of a large number of men who, on the evidence of this murmur, are diagnosed "V.D.H." and invalided home, only to be discharged to duty there?

## THE ENTOMOLOGICAL COLLECTION AT THE ROYAL ARMY MEDICAL COLLEGE.

By Lieutenant-Colonel N. MANDERS.

*Royal Army Medical Corps.*

The following specimens have been added to the collection since the last notice:—

| Name of specimen | Name of donor | Locality | Number of specimens |
|---|---|---|---|
| *Glossina palpalis* .. | Captain J. W. Houghton[1] .. | Wonkufu, W. Africa .. | 8 |
| ,, ,, .. | ,, ,, .. | Mabanta, W. Africa .. | 8 |
| ,, *tachinoides*.. | Captain F. Harvey .. .. | W. Africa .. .. | 1 |

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[1] Regarding these insects Captain Houghton writes: "I could find no horses, cattle or sheep near this village (Wonkufu), and the inhabitants said they would not thrive there. But some eight miles south I struck a Fakai where there were over forty cows, fat and healthy. . . . The remaining specimens I caught on the banks of the Maboley River, near the outpost at Mabanta. A few cattle and sheep are to be found near this place.'

# Report.

## ON THE PHYSICAL TRAINING OF RECRUITS.[1]

Surgeon-General Sir ALFRED KEOGH, K.C.B., *Chairman.*

*Members.*

Lieutenant-Colonel A. M. DAVIES.
Colonel G. G. A. EGERTON, C.B.
Surgeon-General Sir T. GALLWEY, K.C.M.G., C.B.
Dr. J. S. HALDANE, F.R.S.
Lieutenant-Colonel W. G. MACPHERSON, C.M.G.
Lieutenant-Colonel C. H. MELVILLE.
Dr. M. S. PEMBREY.
Colonel S. P. ROLT.
Sir FREDERICK TREVES, Bart., G.C.V.O., C.B.
Captain L. E. L. PARKER, R.A.M.C., *Secretary.*

### REPORT UPON PHYSICAL TRAINING.

### *Introduction.*

It is necessary at the present day, when a large percentage of recruits is drawn from large cities, to provide some system of physical training which shall assist in preparing them for the harder exercises of a soldier's life. Most recruits on joining the Army are clumsy, slow, and awkward in their movements, and require a course of training that will tend to render them stronger, more alert, and more active both mentally and bodily than they were before. All classes of recruits require such training, for even the healthy farm labourer, whose work develops chiefly the power of endurance, requires training in jumping, vaulting, climbing and running.

Physical training improves a man's control over his muscles, increases his self-confidence, inculcates the spirit of discipline, and teaches him to work in unison with other men.

A system of training for the recruit must be most carefully constructed, owing to the great diversity of the raw material. Recruits are drawn from men of every kind of occupation; all classes are represented. A large proportion of the recruits have been out of employment for some time before they enlist. They are "passed" by the medical officer as healthy and likely to make good soldiers, but it must be borne in mind that health is not a quantity which can be measured by the tape or weighed in the balance. There is a difference between health and strength, although they are frequently confused and considered to be synonymous. The recruits are healthy, but many of them are not strong. There are among them many lads who overstated their age at the time of enlistment; they have not finished growing, and lack of sufficient food and healthy employment, it may be of months duration, has often delayed their development. They require more careful training than young boys, for their bodies are less plastic, and their individual peculiarities, whether they be of body or mind, are less easily corrected owing to the lapse of years.

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[1] Being a Report of the War Office Committee on the physiological effects of food, training, and clothing of the soldier, dated April 13th, 1908.

Physical training for recruits must be such that it will not overstrain or injure the youngest or weakest, but at the same time it must be sufficient to improve the strongest. What is required is not a system of medical gymnastics for invalids on the one hand, or a making of professional gymnasts on the other, but physical training for healthy men of various degrees of strength, aptitude for, and experience of, muscular work. The end in view is the production of soldiers possessing agility, power of endurance, promptness and capacity to act in concert, not of acrobats or models of a conventional military physique.

The Committee have observed the old system of physical training, and the new system in its various stages of transition, and development as now embodied in the new "Manual of Physical Training."

### *Old System: "Infantry Training." "Appendix to Training Manuals,* 1905."

A critical examination of the old system of physical training laid down in these official handbooks will be of value, not only because it will give the reasons why that system has been superseded, but because it will also show what is the physiological basis of a sound system of training.

Many of the general rules given in the "Appendix" are excellent. The exercises are to be performed in shirt sleeves or loose uniform, and are to be directed to the development and strengthening of the entire body, and not of one particular part of it. The greatest care is to be exercised to watch each recruit, so as to ensure that the physical training which he undergoes is in all respects suited to his physical powers. In practice, however, these good rules were violated by some of the exercises employed.

There was too much insistence upon the maintenance of the position laid down for each exercise, and it is stated that, "unless the correct position is maintained, the exercise is useless, as no muscular exertion is involved"; that "a strictly military position must always be observed, since it assists greatly in the free and full action of the heart and lungs, and the consequent development of the whole body." Such statements arise from insufficient knowledge, and show a neglect of a most important factor, the personal equation. The correct position and the strictly military position are conventional, and vary from time to time according to orders. Recruits will obtain the benefit of exercise even if the structure of their bodies, determined by inheritance and the growth of eighteen or more years, does not enable them to readily conform to conventional attitudes. The strictly military position, so far from assisting greatly in the free and full action of the heart and lungs, hampers their action, for it is an unnatural and constrained position. There is, indeed, some evidence in favour of the opinion that the strictly military position with the distended and rigid thorax is one of the factors responsible for disordered action of the heart.

The position of attention is a constrained and fatiguing one, a formal military position, in which the weight of the body is to be on the fore part of the feet, and the chin is to be slightly drawn in. On both anatomical and physiological grounds the position of attention is bad; it is wasteful of energy, and can only be defended as a discipline and ceremony.

The exercise known as "deep breathing" was adopted apparently from some system of medical gymnastics; it is not given in Maclaren's "Physical Education." The instruction is that this exercise must be frequently practised for the purpose of increasing the mobility of the chest walls of the men under instruction. This exercise has no sound basis, and in practice is worse than useless. Recruits have been observed during its performance to be inspiring with the thorax and expiring with the abdomen at the same time; the result was venous engorgement. Over-distension of the lungs, when it is frequently practised, produces a decrease in the elasticity of the lung tissue and emphysema; the circulation of the blood from one side of the heart to the other is disturbed; the "wind" is impaired. The instruction for "deep breathing" is to quickly exhale through the mouth; this in practice produces a cloud of small particles of saliva which, in a squad of men close together in a gymnasium, or even in the open air, must increase the danger of infection of tonsillitis and other diseases.

The natural method of improving the "wind" is progressive exercise in running. The heart and lungs gradually accommodate themselves to work harmoniously under the natural stimulation of changes in the composition of the blood. This is the system employed by trainers of athletes, racehorses, and greyhounds. Experience is a far safer guide than theory based upon an erroneous interpretation of the physiology of respiration.

The most constant error in the old system is the importance attached to expansion of the chest. This was introduced apparently by Maclaren, who thought that enlargement of the chest gave freedom of action to the organs within. This view is quite erroneous. The struggling heart and heaving lungs attempting to burst the bonds of the chest is a poetical licence which strongly appeals to the ordinary man. A well-developed chest is a good sign, but it is wrong thinking to suppose that an artificially expanded or distended chest brings strength and improves the "wind." The danger of "chest expanding" exercises and drills was pointed out by Surgeon F. A. Davy, A.M.D., as long ago as 1876.

The expanded and distended chest became, unfortunately, one of the "points" of the soldier, and the fashion reached the height of absurdity in the padded chest. A good "wind" is something more than a big chest; it is the capacity of the heart and lungs to accommodate themselves to the demands made upon them by muscular exercise. It is true that a man with a well-developed chest often possesses a good "wind," but this is due to the fact that he is generally healthy, strong, and accustomed to muscular work. There are, on the other hand, many men with big chests whose "wind" is far inferior to that of men of smaller build. A big chest measurement can be obtained without a corresponding increase in the capacity of the thoracic organs; the pectoral muscles can be developed by special exercises, or fat may be deposited. This is so well known that men rejected for a small chest measurement take a course of exercises especially designed to develop these muscles, and thus acquire the necessary girth. This practice is knowingly recommended to would-be candidates for the Service. A too rigid insistence upon chest measurements may deprive the Army of many capable men.

In the physical training with arms, chest expansion was again one of the chief aims. Such exercises produce big muscles, but not healthy or general strength, or the power of endurance.

The exercise known as "pressing between the bars" is to be condemned. It is true that it develops the muscles of the chest and arms, but this is done at the expense of the heart, especially in weaker men.

The use of the horizontal bar has also been excessive. A soldier ought to be able to pull to the bar and to mount it, but the frequent repetition of the exercise has no value and often produces overstrain.

The dumb-bell exercises are not suitable, for their aim is the expansion of the chest and the development of big muscles.

The old system of physical training did not possess, in practice, that progressive nature which is absolutely necessary for young recruits. Maclaren recognised the importance of gradual progression from easy to more severe work, but his sound views on this question appear to have been forgotten.

Stress has been laid upon the defects of the system in order that they may be avoided in future systems of physical training. The old system was of value notwithstanding its defects. It contained exercises which were not only good, but also essential for the proper training of the soldier, such as marching, running, jumping, vaulting and climbing.

It was noticed that the instructors in the gymnasia issued their orders in a loud, peremptory tone, which appeared to keep the recruits in a condition of tension, ready to respond with movements of an almost explosive nature.

The official tests of proficiency laid down in the "Infantry Training" are not real tests of good training, and the attempts to acquire the strength necessary to pass them probably injured many recruits. It is unreasonable to expect every recruit at the end of the third month of training to be able to pull to the chest on the horizontal bar at least ten times, hands reversed, and to press up on the parallel bars at least fourteen times. The correct tests are those which bring out the recruit's capacity to co-ordinate his muscles, to accommodate himself to the demands of muscular work, and to bear fatiguing exercise without undue distress.

### *The New System of Physical Training: "Manual of Physical Training*, 1907."

During the period of transition and development of the new system the Committee visited Portsmouth, Walmer, and Dartmouth, where they received every facility for studying the system of physical training which has been introduced recently into the Royal Navy. The Committee were greatly impressed with the training, and considered it to be far superior to the old system employed in the Army. Progression is the keynote of the naval system; efficiency is not sacrificed for appearances, and the danger of distension and rigidity of the chest is recognised. Much useful information and many suggestions were obtained, and the Committee wish to express their obligations to the officers of the Royal Navy who were in charge of the training.

The physical training of the Experimental Company, raised by the patriotic action of the *Spectator*, was inspected, and the Committee wish to thank Mr. St. Loe Strachey and Colonel Pollock for the opportunity of seeing the results of that interesting experiment. A visit was paid to the gymnasium of the Regent Street Polytechnic in order to see the system in use among civilians. The thanks of the Committee are due to the directors of that excellent institution.

The development and working of the new system were followed by the Committee during their visits to Aldershot, Cardiff, Tidworth, Newcastle-on-Tyne, Halifax, Reading and Hounslow. In addition to these visits and meetings of a special sub-committee, there were consultations with Colonel Rolt, Inspector of Gymnasia, and Major Moore, Assistant Inspector of Gymnasia. After certain modifications had been introduced in the original scheme, the "Manual of Physical Training," prepared by Colonel Rolt and Major Moore, with the assistance of Lieutenant Langkilde of the Danish Army, was issued in its present form.

The object of the present training is to make a weak man strong and a strong man stronger and more agile, and above all to prepare him for the further and more arduous duties of the soldier. The main principle is progressive exercise. The earliest work is of an easy nature and short duration; gradually the work is made harder and of longer duration, and the energy and capacity of the man for work are developed. At no stage is the recruit overtaxed. By such a graduated progression time is allowed for the co-ordinated action of the various organs of the body, especially the heart and lungs. The harmonious working of all parts of the body is recognised as all-important. The excessive development of muscles and the acquirement of acrobatic tricks are discouraged, because they are of no special value to the soldier.

The training of the nervous system to control the action of the muscles is provided by exercise in jumping, vaulting, climbing and balancing; the soldier not only acquires strength and agility thereby, but also self-confidence and courage. The acquirement of such powers is, moreover, of the highest practical value to the soldier in the field.

Another essential in the physical training of the soldier is the inculcation of the spirit of discipline, the unhesitating response to the word of command. This is most readily obtained by considerate teaching, the quiet correction of faults, encouragement and the development of emulation among the men. A bullying manner and peremptory orders only foster a sense of discontent and injustice in the recruit who is trying to do his best. Equality in physical and mental capacity does not exist, and the personal education of the pupil is always considered by the intelligent instructor. Such is the excellent advice laid down in the chapter on "Hints to Instructors," and the good results of this teaching the Committee have seen both at Aldershot and at the various depôts which they have visited.

The importance of performing the physical training out of doors whenever the weather permits, is recognised, and the Committee hope that this will be strictly enforced in practice. Training involves the accommodation of the recruit to an outdoor life; his power of resistance is developed by exposure to changes of weather. Work in the open air "hardens" a man, diminishes his liability to "colds," consumption, and other diseases, and improves his appetite and nutrition.

In the new system there is no attempt to produce the old ideal of a military figure, an over-distended and rigid chest, which resulted only in the impairment of the heart and lungs of the soldier. It is recognised that a good "wind" can be developed only by graduated exercises, which naturally train the heart, lungs, and other organs of the body to work harmoniously together.

So-called "breathing exercises" rightly form no part of this system, which is based upon physiological principles.

Some of the span-bending, dorsal, and abdominal exercises raised doubts in the minds of the Committee. The danger connected with these exercises is the fixation of the chest and the venous engorgement that results. This danger, however, will be removed in future by the strict limitation of these exercises to a very short period, and by the recognition of the fact that they are borne more easily by the healthy young recruit than by the older soldier, whose body is less plastic.

The Manual contains sections upon anatomy and physiology in relation to physical training, but too much importance must not be attached to a knowledge of the names and actions of different muscles. The Committee are of opinion that in the examination of instructors attention should be paid to their capacity to carry out the important principles already mentioned, not to their knowledge of a few anatomical terms. A man may be an excellent instructor, although he does not know the name of a single muscle; an expert anatomist will be a bad trainer if he does not recognise the physiological principles of progression, accommodation, and co-ordination.

The Committee wish to endorse the following statement:—

> "The ability to cover long distances in the ranks without undue fatigue can only be acquired by practice on the line of march,"

and to urge the importance of progressive training in marching. In this connection they wish to draw attention to the remark upon p. 15 of the Manual, viz.: "These physical exercises should be given to the men when necessary throughout the year, and especially during the winter months, and whenever the manœuvre and other work of the soldier is not sufficient to keep him in the required condition of fitness." If a soldier is well fed, he will be better in health if he be well worked; plenty of work is one of the best safeguards against intemperance and vice, and will prepare men for active employment when they leave the Service. There is evidence to show that the soldier does not receive enough progressive training in route marching and digging. The Committee strongly suggest that, after the first month of service, every recruit should perform one route march weekly, both at the depôt, and headquarters of his battalion, until finally dismissed physical training. Each of these route marches should be progressive in character, both as regards distance and weight carried.

The Committee are of opinion that a great improvement in the physical training of the soldier will be effected if the principles laid down in the Manual are loyally and actively carried out.

It is necessary to point out that even under the new system it would be possible for an instructor to introduce the evil of chest-expanding exercises, if he followed only the letter of some of the exercises and not the spirit of the training. Carriage is not of such vast importance that it should be unduly cultivated at the expense of efficiency. The soldier ought to be able to march, and to march carrying his equipment, for long distances without undue fatigue.

There is a considerable danger of false ideals being fostered by the public competitions and displays in which the Army takes part. The duty of a soldier is to be a good soldier, not a gymnast or acrobat. In all competitions and displays under official sanction the exercises should be of military value. Obstacle races in which there is ample scope for running, jumping, vaulting, and climbing, should be encouraged; for, apart from their direct value in the training of the soldier, such exercises place a clear object before the recruit, allow free play for the personal equation of each man and do not involve any prolonged strain. Many exercises, such as boxing, wrestling, swimming, bayonet fighting, and fencing should be encouraged in preference to tricks upon the horizontal bar, parallel bars, bridge-ladder, and pair of rings. It is most important that sound views upon these points should prevail, for the physical training in the Army reacts upon the entire country. Officers frequently act as judges in the competitions at the universities and public schools, and the instructors in such institutions are drawn almost entirely from non-commissioned officers.

The Committee hope that the tendency to perform the physical training indoors, on account of the apparatus and groundless fears of "colds" in winter and heat-stroke in summer, will be firmly combatted. The soldier must be trained to resist changes of weather in the same way that the farm labourer and the athlete are "hardened." Most so-called "colds" are infectious diseases, and are most prevalent among men who spend their lives chiefly indoors; any fear of heat-stroke in this country may be dismissed, provided that the men are suitably clothed.

It is important that all officers, without any exceptions, should understand the principles of a sound system of physical training; this they could acquire without learning the name of a single bone or muscle in the body; indeed, it would be well if they were warned of the danger of taking anatomy as a guide in questions of physiology. The chief training of the soldier is outside the gymnasium. During drill on the barrack-square, during route marching, during intrenching and other field work, the dangers of too rapid training, constrained carriage of the body and unsuitable clothing are as great as in the gymnasium. These are subjects which will be considered in later reports, but they are mentioned here in order to remove any impression that the physical training in the gymnasium is solely responsible for the prevalence of cardiac disorder in the Army.

# Reviews.

THE POCKET OSTEOLOGY. By Philip Turner, B.Sc., M.B., F.R.C.S. 187 pp., fcap 8vo. London: Baillière, Tindall and Cox, 1908. Price 3s. net.

We have received the above-named book, which has been placed in the Royal Army Medical College Library.

QUESTIONS AND ANSWERS UPON AMBULANCE WORK. By John W. Martin, M.D., and John Martin, F.R.C.S.Ed. London: Baillière, Tindall and Cox, 1908. 108 pp. 1s. Sixteenth Edition.

This should be a useful little book of notes for members of ambulance societies preparing for examination, and also for instructors in helping them to draw up sets of lectures. The questions are practical, and the answers sound, clear, and concise.

FIRST AID TO THE INJURED AND SICK. By F. J. Warwick, B.A., &c., and A. C. Tunstall, M.D., &c. Bristol: John Bright and Co., 1908. 252 pp. 2s. 6d. cloth, 1s. paper.

This, on the other hand, is an ambulance handbook for advanced students. The section on anatomy is so compressed as to require previous knowledge for its comprehension, but should be very useful for reference, while the sections on physiology are clearly and simply written, containing all of that science that a student of first aid requires to know. The chapter dealing with transport of sick and wounded has been extended, and is most comprehensive from the point of view of civil ambulance work; and although the quotations from the "manual" for the Royal Army Medical Corps, 1904, will be out of date when the new edition of that book is published, the differences will be more in nomenclature than in method. The handbook, which is well illustrated and possesses a good index, should be useful to all engaged in the practice of first-aid duties, and the price is very modest.

MEDICAL LABORATORY METHODS AND TESTS. By Herbert French, M.A., M.D., Assistant Physician, Guy's Hospital, &c. Second Edition. London: Baillière, Tindall and Cox, 1908. Price 5s. net.

By no means the least important of the changes which the Twentieth Century has already seen in the practice of physic is the extensive enlistment of laboratory methods into the diagnosis of disease. The microscope and the test tube have become as essential to the scientific physician of to-day as the stethoscope and the clinical thermometer were to his colleague of yesterday.

The appearance of a second edition of Dr. French's work, in the short space of three years, is confirmatory evidence, if such were needed, of the aid now sought by the clinician from the chemist and the pathologist.

This little book is divided into ten chapters, dealing with the examination of the urine, blood, sputum, pus, gastric contents, serous exudation, cerebro-spinal fluid, fæces, and cystic fluids; the microscopic examination in affections of the skin; the preservation and staining of morbid anatomy specimens; and the tests for the commoner poisons.

Where all is so excellent it is difficult to choose, but we think the best chapter is that dealing with the urine.

In the account of the examination of the blood we should like to have seen a more detailed account of the early diagnosis of enteric fever by blood culture, whilst in the account of the examination of syphilitic sores, we should have expected the more correct term of *Treponema pallidum* instead of *Spirochæta pallida*.

Dr. French has, like many authors, his own method of applying Neisser's stain. Personally we are inclined to think that it requires considerable dexterity to stain in four seconds, and we prefer the longer methods for persons who are not skilled bacteriologists, but perhaps an exception might be made in favour of the excellent plan given by Abel, which is the quickest and best means with which we are acquainted.

These points are, however, matters of the merest detail, and we congratulate Dr. French on having produced a laboratory guide which should be in the hands of every officer of the Corps who claims to practise specially as a physician.

R. I. B.

GLANDULAR ENLARGEMENT AND OTHER DISEASES OF THE LYMPHATIC SYSTEM. By Arthur Edmunds, F.R.C.S., &c., Surgeon to the Great Northern Central Hospital. Oxford Medical Publications. 7s. 6d. net.

In this small volume of 230 pages, the subject has been considered from a practical and a surgical standpoint. It is one which is of particular interest to the Army surgeon, seeing that it deals with a number of conditions which are very prevalent in military hospitals. There are a number of "tips" which will be found most useful to the operating surgeon, more especially in connection with the removal of tubercular glands. The chapter on cellulitis is particularly good, and that on opsonins is very clear. The whole work is most readable and helpful, and is one which is well worth perusal.

F. J. W. P.

AN ESSAY UPON DISEASE, ITS CAUSE AND PREVENTION. By G. E. Richmond, M.D.(Lond.). London: H. K. Lewis. Price 2s. net.

An essay on preventive medicine by a physician who had the privilege of serving with the Yeomanry hospitals in the South African War must command the consideration of officers of the Corps.

Dr. Richmond's little book is divided into five chapters, dealing with "Life, Health and Disease," "Influence of Diet and Environment on Disease," "Functional Diseases and their Causes," "Some Organic Lesions," and "Some Suggestions for Prevention." The first chapter swallows up forty-seven out of a total of ninety-six pages.

Dr. Richmond admits in the preface that his essay has been written rather hurriedly, and without the opportunity of reference to other medical works dealing with the same subject. We must take this statement as an excuse for the defects of an essay which is on the whole decidedly disappointing. It contains a great deal of excellent but badly digested material, and abounds with dogmatical statements which are far from being accepted medical aphorisms. For instance, we are informed that "spinal curvature is probably produced by a toxin which, when swallowed, sets up irritation of the stomach and then irritation of the nerve ganglia, but being a different toxin to that producing herpes it affects motor nerves supplying the muscles of the back." Again, we notice such statements as "Butter, coffee, milk contain poisons acting upon the heart, and sometimes a poison which produces great muscular and nervous prostration, rendering all active exertion almost impossible." We must express a pious hope that this opinion will not come to the knowledge of a prisoner's friend defending a soldier for neglect of duty. Evidence showing that the man's breakfast contained these very ordinary ingredients would be quite sufficient proof, according to Dr. Richmond, that his morning meal might have contained a poison rendering the man incapable of physical exertion!

Dr. Richmond's suggestions for prevention of disease are excellent, but Utopian. He says "a medical expert should be attached to every milkman, every baker, every grocer, and every butcher, who should hold himself responsible for any disease which may arise from any food coming from that shop or establishment, and should at once take steps to prevent any further sale of any infected articles, or, as far as possible, prevent them being eaten if they have been sold." A very different mental attitude must be attained in the minds of the great bulk of the profession before such an ideal state of things can be dreamed of, and Parliament will have to completely alter its line of action before such powers are placed in the hands of a profession whose growing influence in the State is regarded by many with considerable jealousy.

We are, however, cordially at one with the general aim of the author's suggestions, and would like to see the general practitioner linked up more thoroughly with the public health forces; but we would like to know what our specialists in advanced surgery have to say to Dr. Richmond's dictum that "the time will come when the operations of surgery will become unnecessary, and the art of surgery will be looked upon as one of the relics of the bygone barbaric times of the nineteenth century"?

DIE EXPERIMENTELLE DIAGNOSTIK, SERUM-THERAPIE, UND PROPHYLAXE DER INFECTIONS KRANKHEITEN (Diagnostic Methods, Serum Therapy, and Prevention of Infectious Disease). By Stabsarzt Professor Dr. D. Marx. 398 pp., with 2 charts, 8½ inches by 5½ inches. Second edition of Vol. XI. of the Bibliothek von Coler-Schjerning. Berlin, 1907: Hirschwald. Price 9s. 3d.

The Coler-Schjerning library is a series of books written on subjects of special importance to Army medical officers, and modern methods of detecting, preventing, and rapidly curing diseases of an infectious character are of absorbing interest in military life.

The second edition of Dr. Marx's volume leads one to expect that the most recent information on all these matters would be presented, and this will generally be found to be the case. The book contains twenty-seven chapters, an appendix, and an index. With the exception of the first chapter, which deals with the products of immunisation and their development and constitution, each chapter is devoted to a consideration of one or other of the infectious diseases, or groups of infectious diseases, such as cholera, enteric fever, plague, tuberculosis, infectious pneumonia, dysentery, venereal diseases, Malta fever, malaria, trypanosomiasis, yellow fever, the acute exanthematous fevers, &c. The chapters are short and well arranged, and are followed by a useful bibliography. Occasionally one notices some inexplicable omissions, especially in a work of this kind, such as the absence of any reference to the recent discoveries regarding the method of transmission and prevention of Malta fever. In fact, the remarks on this point are to the effect that the prevention of the disease has as yet no sound basis of scientific knowledge, and that it is probably by the respiratory passages or by subcutaneous inoculation that infection arises. The part played by goats and goats' milk appears to have escaped the author's notice, although he refers to works published in 1906 and 1907.

W. G. M.

DIE VERWUNDUNGEN DURCH DIE MODERNEN KRIEGSFEUERWAFFEN (Wounds Caused by Modern Firearms). Vol. I. by Stabsarzt Dr. Hildebrandt. Vol. II. by Stabsarzt Dr. Hildebrandt and Stabsarzt Dr. Graf. Vol. I., 278 pp., with 2 tables and 109 illustrations in text. Vol. II., 500 pp. with 180 illustrations in text, 8vo. Vols. XXI. and XXII. of the Bibliothek von Coler. Berlin: Hirschwald, 1907. Price 20s.

This important addition to the Bibliothek von Coler appears in two volumes, the first written by Dr. Stabsarzt Hildebrandt, one of the assistants in the surgical clinic of the Charité Hospital, Berlin, and the second also by him in conjunction with Stabsarzt Dr. Graf, of Düsseldorf.

The first volume deals with the subject in its general aspects, and is based upon the experience of modern firearms during the author's participation in the South African War and in the Boxer Expedition. He divides his subject into two parts, the first containing a full description of modern firearms, their development, present construction, ballistics, and general effects; and the second dealing with the nature of the wounds caused by them. The details are all extremely complete, and probably in no other work of a similar kind is so much accurate and valuable information to be found. The illustrations, too, are clear and instructive. In treating of the general nature of the wounds caused by modern firearms, Dr. Hildebrandt enters into considerable detail regarding their pathology and treatment, dividing his subject into chapters, in which the effects of wounds of the different systems are considered.

The second volume is devoted entirely to the wounds caused in the different anatomical regions, such as wounds of the head, of the face, neck, spinal column, of the trunk, including the thorax and the abdomen, and of the extremities. In all cases statistics are given, and the works of Stevenson and others are freely quoted or referred to.

Both volumes are of convenient size and weight for use on field service.

W. G. M.

DIE HANDGRANATE (Hand Grenades). By Generalarzt Dr. A. Villaret. 50 pp., 8vo. Stuttgart: Ferdinand Enke, 1908.

This is a short pamphlet which brings very opportunely to notice the fact that the hand grenades of old times have suddenly again come into use in the Russo-Japanese War, and must therefore be studied by the Army medical officer in consequence of the special character of the wounds produced by them. Surgeon-General Villaret commences by giving a very interesting and concise historical statement of the use of hand grenades from the year 1427 onwards, and follows this with an historical account of the employment of grenadiers in armies. He then proceeds to give a detailed account of the use of grenades in the Russo-Japanese War, dividing his subject into the employment of hand grenades, the different kinds of hand grenades that were used, and the wounding effects of the hand grenades, along with some statistics. He draws his facts mainly from the articles of Nórregaade, Oettingen, Schaefer, Curey, Matignon, and others.

In the concluding chapter the author enters into questions of the use of such weapons from the point of view of the Hague Convention, and expresses his opinion forcibly that such weapons are admissible, because the object of war is to end it as soon as possible. He is a firm believer in armies being at liberty to use any method for attaining this object, and in making war as terrible and destructive as possible.

The pamphlet is an opportune one, and is an excellent compilation of the literature of the subject in Germany and France. It contains a bibliography of forty works or articles to which the author refers.

W. G. M.

## Current Literature.

**Vision and Shooting in the American Army.**—An editorial in the *Military Surgeon* for May, 1908, gives some notes on the new vision tests and on Major Shaw's shooting experiments at Fort Slocum, New York, repeated at Fort Riley, and tending to prove that men with blurred distant vision of the target were as good (even better) shots as men with emmetropia, provided they could accommodate the eye to see the sights on the rifle.

W. G. M.

**Scurvy during the German South-west African War.** — An article by Stabsarzt Franz in the *Deutsche Militärärztliche Zeitschrift* of November 20, 1907, gives the etiology, symptoms and treatment of scurvy, which appears to have been very prevalent in South-west Africa. The author tells nothing new relating to etiology, and his views, viz., that it is due to anomalies in metabolism and alteration in blood-vessels, are purely theoretical. He gives no statistics, but states that it never occurred as a primary disease, but always as a sequel to or concomitant with other diseases.

W. G. M.

**Improvised Operating Table, &c., at a Regimental First-Aid Station.**—To the *Archives de Médecine et de Pharmacie Militaires* for November, 1907, p. 353, Médecin-Majors Barthélemy and Morisson contribute a paper, illustrating a method of improvising an operating table by placing a stretcher across the shafts of the regimental medical cart. A table for the instruments, &c., is made by placing the tail-board of the cart also across the shafts; the surgeon occupying a space between the two tables. It is a practical, well-illustrated article.

W. G. M.

**A New Method of Estimating Physical Fitness for Military Service.**—(From *Jahrbücher für die Deutsche Armee und Marine* (1), 1908, p. 436.) Med. Majors Pignet and Tardière, of the French Army, have been publishing their experiences in measurements of recruits, with a view to estimating physical values.

Pignet comes to the conclusion that a normal chest-girth is half the height, but he proposes to arrive at co-efficients of fitness by taking the height in centimetres and deducting from it the numerals representing the chest-girth in centimetres and the body-weight in kilogrammes. Thus the physical co-efficient of a youth 154 cm. in height, 78 cm. chest-girth, and 54 kilogrammes in weight, would be 154—(78 + 54) = 22; and a man 172 cm. in height, 80 cm. chest-girth, and 58 kilogrammes weight, would give a co-efficient of 34. He classifies the physique according to such co-efficients thus:—

A co-efficient of 0 to 10 = very strong.
,, 11 ,, 15 = strong.
,, 16 ,, 20 = good.
,, 21 ,, 25 = moderate.
,, 26 ,, 30 = satisfactory.
,, 31 ,, 35 = weak and doubtful.
,, over 35 = unsatisfactory.

In other words, the smaller the co-efficient the stronger is the physical development.

Tardière's method is different, but also aims at arriving at co-efficients indicating degrees of robustness. It is very simple, and depends on co-relation of body-weight to height only. Thus, a man aged 20 should normally have a body-weight equal in kilogrammes to the number of centimetres over 100 in height, *i.e.*, a man measuring 160 cm. should weigh 60 kilogrammes. He allows for varying degrees of weight below this, and classifies as follows:—

3 to 4 kilogrammes less = very good physique.
5 ,, 8 ,, ,, = good.
9 ,, 12 ,, ,, = satisfactory.
13 ,, 15 ,, ,, = moderate.
over 15 ,, ,, = unsatisfactory.

W. G. M.

**Arrow Poisons in German African Colonies.**—Dr. M. Krause contributes a valuable account to the *Archiv. fur Schiffs-und Tropen-Hygiene* of October, 1907, of pharmacological and physiological investigations into the vegetable and animal poisons of the German Colonies, carried on by himself and Brieger during the past year.

He states that the plant poisons used by the natives as arrow poisons are practically all from the *Apocynaceæ*, and are glucosides, isomeric with the glucoside digitalin of *Digitalis purpurea*. The glucoside is obtained from different species: in East Africa from *Acocanthera venenata;* in the

Cameroons from *Strophanthus hispidus, kombe* or *gratus;* in South-west Africa from varieties of *Pachypodium*, *Adenium* and *Euphorbium*. Very rarely are those combined with other vegetable or animal poisons. Physiologically, 0·06 to 0·09 gramme of the glucoside for each kilogramme weight of the animal is fatal to guinea-pigs. But the natives use the poison for killing big game, such as elephants and hippopotami; and the quantity used on the arrows is sufficient to kill these animals in ten to twenty minutes. In one specimen examined there was enough poison on the arrow to kill forty elephants. For fishing and for arrow poisons in fighting against their fellows, a nitrogenous product is used, chiefly varieties of *Strychnos*.

In the interior of Africa there are numerous other poisonous plants in use, which the authors have been unable to obtain in sufficient quantities for investigation of their properties. They have also been unable to discover any antidote or means of immunising against the effects of the glucoside arrow poisons. They have been able by means of a diastase ferment to split it up so as to be ineffective as a poison in small quantities, but the antidote is useless against the larger doses on the arrows, as these are too rapid in their action.

Of animal poisons, cobra and viper poisons are used. The poisonous snakes are widely distributed and numerous in both East and West Africa. The poisons have a variety of effects, such as that of a neurotoxin, acting on central nerve-cells; a hæmorrhagin, acting on the endothelium of the blood-vessels; a hæmolysin, acting on the red blood corpuscles; a proteolytic diastase, acting on the muscular and other coats of the arteries; and a thrombose, acting on the fibrin ferment. The most poisonous snakes are the salt-water snakes, belonging to the species *Hydrophinæ*, *Distira* and *Platurus*. They are common along the coasts of the Pacific Ocean, with the exception of New Guinea, Samoa and Marshall Islands.

In Africa only the adder and viper poisons are found. These are used as arrow poisons by the bushmen and by the natives of Togoland. The latter obtain their poison almost exclusively by burning and powdering the heads of puff adders, ignorant of the fact that the poison is destroyed by heat. The supposed immunity of the Hereros against snake poison is said to be caused by rubbing into lacerations in the back a powder made of the dried *Hygosoma sundovalli* ("Springschlange" of South-west Africa). The value of this, however, is very doubtful.

Brieger and Krause have discovered antidotes for snake poisons of all varieties, including a serum against colubrine poison, a serum against viperine poison, and a polyvalent serum against all snake poisons, details of which will be published shortly.

The bushmen of the Kalahari Desert use an arrow poison, consisting of a tox-albumin, obtained from the larvæ of a beetle, *Diamphidia locusta*. It is easily destroyed and does not preserve its properties long. It is probably a poison from some pathogenic micro-organism.

W. G. M.

**The Chinese Army Medical Service.**—A good article by Oberstabsarzt Kæther, on the Chinese Army Medical Service appears in the *Deutsche Militärärztliche Zeitschrift* of November 5, 1907. The Chinese standing army, although it existed as such for centuries, never had any medical organisation until after its re-organisation by Yuan Shi Kai, on Japanese models, subsequent to the Boxer troubles. The troops had several European instructors, chiefly German officers, during the Governorship of the Chi-li province by Li Hung Chang, and of the Shantung province by Yuan Shi Kai, in the latter half of the nineteenth century; but the European officers were then treated, when sick, by the missionary doctors, and the men by the Chinese quacks.

The new re-organisation of the Army at present affects the northern provinces only, and the army is known as the Pei-Yang Army of Yuan Shi Kai. It consists of seven divisions: Nos. 1 and 3 in Pao-ting-fu; No. 2 in Yung Ping Fu; No. 4 in Matchang (south of Tientsin); No. 5 in Tsi-nan-fu; No. 6 in Peking; and No. 7 in Tschin-ting-fu. The divisions are organised in brigades, regiments and battalions, as in the Japanese and German armies, each division consisting of four infantry regiments, one cavalry and one artillery regiment, with one pioneer and one train battalion.

The head of the Army Medical Service of this army is Dr. Hsü, Yuan Shi Kai's chief physician. He is also Director of the Army Medical Academy, with its Japanese professors, at Tientsin.

Each division has a principal medical officer, each regiment a regimental medical officer, and each battalion (Ying) two medical officers, namely, a staff-surgeon and an assistant-surgeon ranking as captain and lieutenant respectively. The assistant-surgeons are at present appointed from amongst Chinese doctors with modern medical education; but the staff-surgeons and higher ranks must be men who have passed through the medical schools at Tientsin, Peking, or Pao-ting-fu, or have had a training in Japanese or European universities. These ranks are nearly all vacant at present owing to the small number who have been able as yet to qualify for them. The medical officers complain of being more poorly paid and less considered than the combatant officers.

The subordinate *personnel* is organised on Japanese lines, the establishment being four army medical corps men for each infantry battalion or cavalry regiment, and three for each artillery section.

The uniform is the same as that of the infantry, with the addition of the Geneva Cross brassard.

Auxiliary stretcher-bearers are trained in the regiment from regimental establishments.

The medical equipment with combatant units consists of medical and surgical panniers and stretchers, suitable for transport in waggons or on pack animals. Drivers and leaders of these are train soldiers. The equipment is made in Japan, and is of the Japanese Army pattern. In each division headquarters garrison there is a garrison hospital, with equipment, medical and surgical supplies, &c., in accordance with European ideas; but the complete organisation of these hospitals is a matter of time, as fully educated medical officers are lacking.

During manœuvres, bearer companies were formed of the subordinate medical *personnel* of the hospitals and regiments. They were exercised in preparing regimental and main dressing stations and collecting stations for slightly wounded.

Field hospitals are to be formed in the proportion of six for each division, but as yet none has been prepared for mobilisation.

W. G. M.

# Correspondence.

## SYPHILIS IN THE ARMY.—A REJOINDER.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—With reference to the review of my book "Syphilis in the Army" (John Bale, Sons and Danielsson, 1907), by Colonel F. J. Lambkin, R.A.M.C., in the May, 1908, number of the ROYAL ARMY MEDICAL CORPS JOURNAL, I wish to state that the treatment of syphilis by inunction methods in the early stages has been carried out by me for fifteen years amongst *in-patients* in a routine and very thorough manner. The valuable results obtained at Woolwich since October, 1905, amongst some hundreds of cases in a garrison 5,000 strong are shown in the appended tables A and B. Inunctions are used in the French, German, Austrian, Bavarian and other Armies, as the routine method of treating syphilis. The evidence contained in the Advisory Board, Third Report,[1] in favour of inunctions is conclusive. Colonel Lambkin himself, in reviewing my book, says that he only uses inunctions in "certain" cases, and "that nine times out of ten injections are used in the Army." He cannot, therefore, have much experience of inunction methods since his in-patients and out-patients are ordinarily treated by insoluble injections of grey-oil, or calomel, which he strongly advocates. Major W. A. Ward, R.A.M.C., in January, 1908, writing to me from Rochester Row, says: "It is very seldom patients are put on inunctions, and we have not had a case for a long time"; and therefore I claim that Rochester Row, London, cannot be spoken of in the same class as "Aix or Wiesbaden," as is inferred by Colonel Lambkin. It is not understood how a "description" of the method of inunction as practised by me amongst in-patients at Woolwich can be "crude and antiquated." The omission of the views of the French Dermatological Society last year on insoluble salts of mercury does not "arise from ignorance," but from the fact that my book was in the press very early in the year. It is not stated, however, by the French Society, or any other body of the same class, that injection of insoluble salts is preferable to methods of inunction, or to mouth treatment. M. Scarenzio, Italy, first employed the insoluble salt calomel for injection in 1864.[2] Lang, of Vienna, "first introduced grey oil in 1886. He objects to intramuscular injections as these are more liable to be followed by complications."[1] Lang commonly uses the inunction method. Lafay, of Paris, modified Lang's formula. I am informed that Lieutenant-Colonel A. H. Treherne used this method at Aldershot in 1887. Dr. Arthurs, of London, introduced it into England. Colonel Lambkin began it in September, 1891, using Dr. Arthur's cream.[2] Lambkin's formula "especially in its later form closely resembles the grey oil of Continental writers."[3] I question the "slow absorption and elimination" of insoluble salts of mercury as set forth by Colonel Lambkin—since both are reported to have been sufficiently uncertain, rapid and irregular to cause mercurial poisoning in well-authenticated cases, and even deaths due to this method are recorded in Surgeon-General W. J. Fawcett's article on Egypt.[4] Other deaths and cases of poisoning are recorded.[5] The fact of accumulation of "insoluble" salts of mercury at the site of injection is largely owing to injection into muscles which are primarily intended by nature for locomotion. This may explain their occasionally sudden and uncontrollable elimination. The majority of English opinion in civil practice is strongly adverse to their use. Dr. A. Whitfield, London, "considers the use of insoluble preparations such as grey oil hardly justifiable in view of the recorded deaths from this method of treatment."[6] Mr. Charles Gibbs, London Lock Hospital, states that "severe relapses are twice as frequent after injections as after inunctions, or pill treatment, and iritis is peculiarly common in the relapses from intramuscular injections."[7] Other experts state that "it decimated their clinics." Mr. Arthur Ward, in revising the records of the Lock Hospital, London, says, "he was struck by the numbers of patients who only took one injection and never came again." Mr. Jonathan Hutchinson does not consider "it so good as the administration of grey powder." Dr. Radcliffe Crocker remarks, "From a study of the literature of the subject it seems that the dangers from insoluble preparations are considerably greater than those from soluble. And if salivation once sets in you have no controlling power over it at all."[8] The foregoing is independent testimony contained in the Advisory Board Reports, 1905.

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[1] Advisory Board Third Report on the "Treatment of Venereal Diseases in the Army," October, 1905.

[2] Lancereaux "Treatment of Syphilis," 1869. Translated by New Sydenham Society.

Colonel Lambkin misquotes the following sentence on page 41 of my book. It really reads "to out-patients I would later *for a month* prefer to give potass. iodid. 10 grains *three times daily*, or quinine in liquid form, but for purely Service reasons the man usually receives intramuscular injection treatment." The important reservation "for a month" is omitted, and anyone familiar with Army requirements is well aware that it is difficult to arrange for a soldier out-patient to receive treatment by the mouth three times daily owing to the calls of duty, or sudden transfer to other stations ; and hence the remark that injection treatment is given by me to out-patients "for Service reasons," which I take it are quite obvious enough, and should not be liable to misrepresentation. Potassium iodide, as is well known, assists in the elimination of mercury and so continues the action of the latter drug, and hence its value before beginning a second course on the chronic intermittent plan of treatment, which I adopt. Further, on page 49, last three lines, it is also clearly stated "three to four weeks administration and then intervals of rest, ordinarily suffice, &c." The statement, therefore, "that no mention is made in the book of the necessity of giving potass. iodid. in short intermittent courses" is not correct. I do not state, nor am I "a believer in giving it in the old way *ad infinitum* in conjunction with liq. hydrag. perchlor." as suggested.

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[1] Third Report of Advisory Board, p. 29.

[2] Army Medical Department Reports, 1891, p. 390.

[3] First Report, p. 16.

[4] First Report, Appendix A, p. 64.

[5] First Report, p. 27. [6] Second Report. [7] *Ibid.* [8] *Ibid.*

The "extraordinary statement" of mine that "Syphilis is essentially a disease where we treat symptoms, and at the same time lay the flattering unction to our souls that we are treating the cause," requires to be read with the context, but the opinion arises owing to the admitted fact that tertiary manifestations of syphilis may occur or para-syphilitic affections ensue, despite all forms of treatment. Further, our hospitals and lunatic asylums with their complement of locomotor ataxia cases and General Paralysis of the Insane (70-90 per cent. of such cases, it is commonly stated, being due to previous syphilis) amply endorses the foregoing opinion.

In conclusion, the systematic, not "symptomatic" treatment of syphilis in hospital, preferably by inunction methods in the early stages of chancre and rash before the disease has become established, is the principal feature of my book, despite the attempted inference to the contrary.

Although Colonel Lambkin "regrets the appearance of the book, as coming from the source it does it is only too apt to mislead the profession generally as to the methods which have been and are being used in treating syphilis in the Army, and which have been followed by such brilliant results," yet the medical profession is not easily misled, and in the preface to my book a further light is thrown on the subject by a history of the valuable inception of the regular *out-patient* attendance in the Army, since 1903, in accordance with the provisions of Army order 158 of September, 1903, out of which resulted paras. 1080, 1174, King's Regulations, and later, Appendix VII., R.A.M.C. Regulations. Brilliant results in the Army are principally due to careful treatment in hospital in the initial stages of the disease, to treatment under out-patient supervision, to the control of diseased persons in India, and to the united efforts of Army Medical Officers over a series of years, rather than to any special mode of treatment or to any special individual. My book was reviewed in a quite different style in the *British Medical Journal* of May 9th, *Lancet*, May 16th, *Edinburgh Medical Journal*, May, 1908, and by the *Journal of Dermatology*.

### A.—IN-PATIENTS.

*Local Troops, Woolwich for Five Years.*

SYPHILIS.

| Year | Strength of garrison | Admissions | Average number of daily sick | Admissions, ratio per thousand | Average daily sick, ratio per thousand |
|---|---|---|---|---|---|
| 1903 | 5,484 | 477 | 54·38 | 86·97 | 9·11 |
| 1904 | 5,311 | 331 | 56·76 | 62·32 | 10·70 |
| 1905 | 4,966 | 202 | 30·30 | 41·49 | 6·14 |
| 1906 | 5,096 | 129 | 13·85 | 25·12 | 2·75 |
| 1907 | 4,702 | 87 | 12·79 | 18·50 | 2·71 |

*Remarks.*—Prior to October, 1905, intramuscular injection of insoluble "grey oil" (Lambkin's formula) was used for both in-patients and out-patients with constitutional syphilis. Since October, 1905, I have initiated inunctions of ung. hydrag. as the routine method for in-patients, grey oil injections being reserved for out-patients. Relapse and loss of weight are still very frequent under the use of the latter amongst out-patients, and the effect on the lymphatic glands is not nearly so well marked as with inunctions.

### B.—OUT-PATIENTS.

*Local Troops, Woolwich.*

Cases of syphilis are first treated in hospital by mercurial inunction in the initial primary and early secondary stage. Then potass. iodid. for a month. Then "grey oil" injections.

| Date 1907 | Out-patients Syphilis | Strength of garrison |
|---|---|---|
| July 31 | 171 (venereal sore, 15) | 4,938 |
| August 31 | 137 ( ,, ,, 18) | 3,536 |
| September 30 | 86 ( ,, ,, 3) | 4,350 |
| October 31 | 67 ( ,, ,, 1) | 4,131 |
| November 30 | 65 ( ,, ,, 1) | 4,087 |
| December 31 | 55 ( ,, ,, 5) | 4,097 |
| 1908 | | |
| January 31 | 66 ( ,, ,, 2) | 4,217 |
| February 29 | 62 ( ,, ,, 3) | 4,317 |
| March 31 | 61 ( ,, ,, 1) | 4,462 |
| April 30 | 61 ( ,, ,, 2) | 4,402 |

"Venereal sore" is a term used for cases awaiting later diagnosis of soft chancre or syphilis.

*Woolwich,*
*May 17th*, 1908.

H. C. FRENCH,
*Major, R.A.M.C.*

## "INOCULATIONS WITH YERSIN'S SERUM.—A PERSONAL EXPERIENCE."

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—In the February number of the Journal for 1908 you published a letter from Lieutenant-Colonel McCreery, R.A.M.C., giving a *resumé* of his experience of Yersin's serum.

It may be of interest to Colonel McCreery to learn that, in Mauritius at least, Yersin's serum is not now looked on as a satisfactory or safe therapeutic agent. The Mauritius Medical Society discussed the question, at great length, on no fewer than five occasions, in the early part of 1907. In these discussions the bulk of the opinion was distinctly against the use of the serum either as a preventive or curative measure. In recent years cases of illness following on the injection of the serum have been carefully followed up, and have been found to be numerous, and often severe. The larger number of these cases present only some form of urticaria, such as is mentioned by Colonel McCreery as occurring in his own case, but numerous other cases have shown varying degrees of nerve and joint affections. Dr. Rouget (mentioned by Colonel McCreery), of the Civil Hospital, Port Louis, stated in the discussion at the meeting of the Society that his limited experience of the use of the serum did not admit of his expressing an opinion as to its efficacy.

In connection with the personal experience of Yersin's serum by "N. M.," published in the Journal for November, 1907, it is interesting to note that the officer who accompanied "N. M." from Mauritius to Réunion, and who was injected with the serum at the same time as "N. M.," has since suffered from a most intractable form of urticaria This officer returned from Réunion on April 30th, 1907, *i.e.*, one month after his injection, having then felt no ill effects. He remained quite fit until October 18th, on which day he found a few patches of urticaria on his body. At this time he had no gastric symptoms and no rise of temperature, while no immediate cause could be discovered. The eruption persisted with varying severity until January, the irritation causing much discomfort. Treatment seemed to have no effect, and the condition subsided gradually. I have discussed this case with Dr. Lorans, Chief of the Mauritius Medical and Health Department, and with Dr. Blackburn, the local plague authority. Both agree that it is probably a case of late after-effects of serum injection.

I am, &c.,
G. S. WALLACE,
*Lieutenant, R.A.M.C.*

*Port Louis, Mauritius,*
*April 12th, 1908.*

## *CORDYLOBIA ANTHROPOPHAGA* (TUMBU-FLY).

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—In the January number of the Journal for 1908 there are some interesting papers upon the larva of *C. anthropophaga* (Tumbu-fly), to which I would like to add a few remarks. I have had many cases of this affection to treat during the last ten years, a few in West Africa, but by far the greater majority in South Central Africa, where this fly is abundant.

Amongst the Mang'anja-speaking tribes of the Nyasa basin it is known as the mputsi (*lit.* maggot). This fly appears to be more in evidence at the close of, and immediately after, the wet season; and appears to be very local in its distribution (as evidenced by the cases seen). The natives say that the maggot is laid directly upon the skin, effects an entrance at once, and then grows. Maturity is reached in seven to eight days, when it is easily expelled by a gentle squeeze. The tension inside the "boil" is so great that the maggot is discharged to a distance of 6 to 8 feet. The deposition of the larva has also been observed by Europeans, including the present Deputy-Governor, Major F. B. Pearce, C.M.G., so I think that this fact is fairly well established.

In contrast to the observations of Major F. Smith, D.S.O., the site of the maggots is in nearly every case upon *exposed* parts, and I have not yet met with a case in which the genital area was involved. Briefly, the sites selected are: *European infants*—Scalp and hands, particularly between the fingers. These parts are exposed while asleep. The scalp is a very favourite site. *European adults*—Neck (back of), arms, chest, upper part of back. I have met with one case in the abdomen and a few in the legs. The abdominal case was explained by the habit of lying naked during the midday siesta. *Natives*—In these the site is very largely found in the lower extremities. The infants are affected in the scalp in much the same way as European infants; the explanation being that while young and helpless, a fly buzzing round the head, the most exposed part, is not disturbed or driven away. *Animals*—These in *captivity* appear to be very liable Puppies are especially the object of attack, but monkeys and cats are also attacked. I removed over a dozen from a tame lemur under an anæsthetic, the cheeks being bored through in places, the maggot being exposed at both ends.

I hope during this year to settle definitely the mode of entry of the larva, and should this be done I will communicate the result.

I am, &c.,

*Karonga, N. Nyasa,*
*March 14th,* 1908.

F. HALLAM HARDY.
*Captain, R.A.M.C.*

## "NON-REVERSAL OF THE JEJUNUM" METHOD OF PERFORMING GASTRO-ENTEROSTOMY.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—In an address by Mr. Moynihan, published in the *British Medical Journal* of May 9th, 1908, he draws attention to what he considers to be a fallacy in Dr. W. J. Mayo's reasoning in his advocation of the "non-reversal of the jejunum" method of performing gastro-enterostomy. A recent case in which I performed this operation according to Dr. Mayo's method lends support to Mr. Moyniham's views.

The patient died on the fourth day after the operation, and, at the *post-mortem examination*, it was found that the distal limb of the jejunum, instead of passing direct to the left abdominal fossa, as it had done on completion of the anastomosis, was directed forward and to the right. This struck me at the time as being a remarkable condition, and as being possibly explicable on the supposition that it was an autogenous reproduction of iso-peristalsis (the pylorus was much stenosed). In this case the position of the patient was not apparently responsible for the direction of the jejunum, as the dorsal semi-recumbent position had been maintained until death. Vomiting ceased entirely after the operation, and there was no discoverable obstruction in the anastomosis or rotation of the jejunum on its longitudinal axis.

Mr. Moynihan now attaches the bowel in the vertical plane, whereas Mr. Mayo Robson, according to his article in the recently published third volume of "Keen's Surgery," makes the attachment transversely (with "reversal" of the jejunum). Probably the exact direction of the stoma is quite unimportant.

I am, &c.,
R. W. WRIGHT,
*Lieutenant-Colonel, R.A.M.C.*

*Woolwich,*
*May 14th,* 1908.

## THE CAUSATION OF TWINS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—There has come to my knowledge, in regard to a certain man whose wife consistently presents him with twins, information which seems to upset the received ideas as to the respective parts of the male and female in the perpetuation of species; for we generally consider the ovum to be the future individual, and look upon the male secretion as merely a fertilising agent. The text-books show us pictures of spermatozoa in swarms proceeding on their fertilising errand. The same text-books tell us that spermatozoa with two heads are sometimes seen. In the particular man now under discussion the semen contains none but two-headed spermatozoa. The conclusion is inevitable—the twin spermatozoon produces twin human beings.

The subject is a difficult one to pursue, but I hope someone may be able to ascertain whether the case here dealt with is one of mere coincidence.

In the meantime, one cannot help thinking that the male will prove to play a more important part in the production of offspring than has hitherto been assigned to him—that the female is not entitled to the all-important position with which she is often credited. This aspect of the matter has a bearing on questions of heredity.

*Rawal Pindi*,
*April 22nd*, 1908.

I am, &c.,
F. SMITH,
*Major, R.A.M.C.*

## THE TREATMENT OF SCABIES BY BALSAM OF PERU.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—The experiences of Lieutenant W. G. Avis are very interesting, but are so markedly different from ours at the station, that I hope other officers will kindly send theirs to the Journal. Since its introduction here by Lieutenant-Colonel S. C. B. Robinson, we have never seen the slightest reason for giving it up, or for returning to the old unsatisfactory treatment by sulphur ointment.

We have had several new commanding officers since it was started, and they have all been speedily convinced of the virtues of the balsam treatment. If *properly carried out*, the cure is rapid and permanent; I have never found eczema produced by it, and neglected cases in which there was pustular eczema present as a complication of the scabies, have never been made worse.

I am, &c.,
F. J. W. PORTER,
*Major, R.A.M.C.*

*Colchester*,
*June 16th*, 1908.

## ROYAL ARMY MEDICAL CORPS MESS, MILLBANK.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—In order to correct some existing misapprehension of the Mess Rules, I should be glad if you would allow me through the medium of the Journal to let it be generally known that all officers of the Corps on the Active List are Honorary Members of the Mess at Millbank, and it is much desired that they should use the privilege.

To save trouble the Mess Committee has arranged that visiting officers only using the Mess at odd times can settle their bills before leaving.

I am, &c.,
D. WARDROP,
*Colonel, Commandant and Director of Studies,*
*Royal Army Medical College, London.*

VOLUME XI. AUGUST, 1908.

# Journal of the Royal Army Medical Corps.

## Original Communications.

### SPINAL ANALGESIA IN SIERRA LEONE.

By Captain J. W. H. HOUGHTON.
*Royal Army Medical Corps.*

These nineteen cases in which spinal analgesia was used, were operated on in Freetown, Sierra Leone, the subjects, with the exception of one white gunner, being West Indian soldiers or natives from the hinterland. The numerical paucity of the cases is due to the fact that no more cases presented themselves for operation, and during the last five months they represent the total surgical procedures underaken here in which spinal analgesia was applicable. I offer no apology, however, for recording such a limited number of cases, as it is only by publishing all cases anæsthetised by this method (however small the series) that definite ideas can be formed as to its value. Small as the numbers are, they demonstrate the fact that the procedure can be successfully undertaken on coloured patients, with a minimum of equipment, in places far remote from the conveniences of a modern operation theatre.

The principles guiding the use of the anæsthetics in these cases were those formulated by Mr. A. E. Barker and carried out by him at University College Hospital, and by Major C. G. Spencer, R.A.M.C., at Millbank. Stovaine was the analgesic used in each case, and the procedure was as follows: A solution was made up containing 5 per cent. stovaine and 5 per cent. glucose in distilled water. This solution was made in bulk, and when required the necessary amount was poured into a test-tube and sterilised by boiling. The special needle and syringe (made by Krohne and Sesemann) were sterilised by boiling, and 1 cc. of the stovaine solution was drawn up into the syringe. They were then laid down on a boiled towel.

The patient was now brought into the operating theatre, which usually consisted of a small match-boarded room with a door and window. He was placed on the operating table, a 6-foot barrack-room article on trestles. He was then instructed to sit up with his legs hanging over the edge of the table, and told to place his elbows on his knees and his head on his hands. This position I found most suitable for the puncture, as it gives most room between the lumbar spines, and when dealing with coloured patients, whose ignorance makes them more apprehensive than the average white individual, they were unable to see what was going on, and in this attitude could neither kick the operator nor break his syringe. The back was now cleaned and the fourth lumbar spine defined. With a finger on either side of the third lumbar interspace to steady the skin, the needle, with stylet in position, was introduced in the middle line above the fourth spine and thrust forward through skin and interspinous ligament. The stylet was then withdrawn and the needle thrust further until an escape of spinal fluid showed that the canal had been entered. Here I may remark that the interspinous ligament in a well-developed West Indian appeared to offer more resistance to the point of my needle than the same ligament in an English soldier, but perhaps the needle point had suffered in transit to the coast or became dulled by exposure to this climate. The cannula attached to the loaded syringe was next inserted through the hollow needle and pushed home, and the stovaine solution slowly injected. When this was accomplished the needle and syringe were quickly withdrawn and the patient laid on his back with pillows under his head. The patient's pelvis was now elevated by a broom handle placed under his sacrum and raised by two assistants to the required height. This elevation was maintained for a couple of minutes or was dispensed with when the operation area was localised to the perineum.

The tabulated notes of each case show that little difficulty was experienced in reaching the spinal canal. In the case of the native female, No. 9, there was no escape of spinal fluid on puncture, but on withdrawal of the needle a drop of clear fluid was seen at its point, showing that the canal had been entered; but as the patient was apprehensive and restless on injection was made and the operation was performed under a general anæsthetic.

Two cases out of the nineteen injected had a slight attack of nausea while on the table. This was transitory in character and completely passed off before the operation was finished; it did not recur when they were removed to the ward. In three cases, slight headache came on about four hours after the operation; it was mild and soon passed away without treatment. In one case there was severe headache for ten hours after the operation, but the patient was quite comfortable the next morning.

Small as this record is, it shows the value of spinal analgesia to those who are often far removed from skilled assistance. In six of the cases here tabulated the procedure was undertaken with no skilled assistance; if spinal analgesia had not been available these operations could not have been performed without the help of a qualified anæsthetist.

The female patients were operated upon in the Princess Christian Hospital by Dr. Mayhew. The operations were all difficult and lengthy procedures, which, with one exception, were completed under spinal analgesia. I am particularly indebted to Dr. Mayhew for his courtesy in allowing me to anæsthetise the cases and assist him in the interesting operations.

I should also like to record my thanks to Captains H. N. Ross Packer and F. P. Lauder, R.A.M.C., for their cases analgesed by this method, and also for the interest they took in the procedure.

## TABLE FOR SPINAL ANALGESIA.

| Date, sex and age | Rank and name | Operation | Position of patient during injection. Puncture easy or not | Size of puncture, and amount of spinal fluid withdrawn | Amount of stovaine solution injected | Position of patient after puncture. Pelvis raised or not | Time from puncture: (1) To analgesia (2) To beginning of operation (3) To end of operation | Maximum height of analgesia | Condition of patient during operation | Duration of analgesia and after-effects in ward |
|---|---|---|---|---|---|---|---|---|---|---|
| 15.1.08. Male, 17 years | Boy Exell, 1st W.I.R. | Removal inguinal glands, left side | Sitting up; easy | 2nd space; 3 cc. withdrawn | 5 cgr. stovaine | Laid on left side, pelvis raised 2 in. for 2 min. | (1) 2 mins.<br>(2) 8 mins.<br>(3) 25 mins. | 4th rib | Vomited slightly, otherwise good | Analgesia in toes, 90 mins. Slight headache same evening. No vomit. Operator, Capt. Ross, R.A.M.C. |
| 23.1.08. Male, 22 years | Pte. Hinds, 1st W.I.R. | Removal femoral glands, right side | Sitting up; easy | 3rd space; 3 cc. withdrawn | ,, | Laid on right side, pelvis raised 1 in. for 1 min. | (1) 2 mins.<br>(2) 6 mins.<br>(3) 15 mins. | Umbilicus | Excellent .. | Analgesia in toes, 60 mins. No headache. No vomit. Capt. Ross, R.A.M.C., assisting. |
| 23.1.08. Male, 36 years | Pte. Bartlett, 1st W.I.R. | Urethral stricture | Sitting up; easy | 3rd space; 5 cc. withdrawn | ,, | Laid on back, no elevation | (1) 2 mins.<br>(2) 8 mins.<br>(3) 25 mins. | Analgesia confined to perineal region | ,, .. | Analgesia in perinæum, 65 mins. No headache. No vomit. Capt. Ross, R.A.M.C., assisting. |
| 24.1.08. Male, 28 years | Pte. Jackman, 1st W.I.R. | Septic wound, left foot | Sitting up; easy | 3rd space; 5 cc. withdrawn | ,, | Laid on left side | (1) 2 mins. in perinæum, 6 mins. in toes, left foot<br>(2) 8 mins.<br>(3) 15 mins. | Umbilicus left side, lower right side | ,, .. | Analgesia in toes, 60 mins. No headache. No vomit. Native orderly assisting. |
| 25.1.08. Male, 27 years | Pte. Homer, 1st W.I.R. | Exostosis on first metatarsal bone, left foot | Lying left side; easy | 3rd space; 4 cc. withdrawn | ,, | Remained on left side | (1) 2 mins.<br>(2) 8 mins.<br>(3) 30 mins. | 6th rib, left side | Good; slight vomit | Analgesia in toes left foot, 90 mins. No headache. No vomit. Native orderly assisting. |
| 27.1.08. Male, 25 years | Pte. Lackley, 1st W.I.R. | Removal femoral glands, right side | Sitting up; easy | 3rd space; 2 cc. withdrawn | ,, | Laid on right side, pelvis raised 2 in. for 2 mins. | (1) 2 mins.<br>(2) 10 mins.<br>(3) 20 mins. | Crest of ileum | Excellent .. | Analgesia in toes, 85 mins. No headache. No vomit. Capt. Ross, R.A.M.C. assisting. |

|  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
| 27.1.08. Male, 31 years | Pte. Palmer, 1st W.I.R. | Circumcision | Sitting up ; easy | 2nd space ; rapid flow, 10 cc. withdrawn | 5 cgr. stovaine | Laid on back, no elevation | (1) Perinæum in 2 mins. knees in 10 mins.<br>(2) 5 mins.<br>(3) 10 mins. | Poupart's ligament | Excellent .. | Analgesia in toes, 65 mins. No headache. No vomit. Lieut., R.G.A., assisting. |
| 11.2.08. Male, 21 years | Pte. Joe Front, W.A.R. | Hernia, right inguinal | Sitting up ; easy | 3rd space ; good flow, 1 cc. withdrawn | ,, | Laid on back, pelvis raised 3 in. for 5 mins. | (1) 5 mins. to umbilicus<br>(2) 10 mins.<br>(3) 45 mins. | Xiphisternum | ,, .. | Analgesia in toes, 70 mins. No headache. No vomit. Operator, Capt. Packer, R.A.M.C. |
| 12.2.08. Female. 16 years | Marianna .. | Failed after two punctures to withdraw sufficient spinal fluid to ensure that the point of the needle was in the dural sac. No injection of stovaine |  |  |  |  |  |  |  |  |
| 17.2.08. Male, 25 years | Pte. Gooden, 1st W.I.R. | Circumcision | Sitting up ; easy | 3rd space ; rapid flow, 10 cc. withdrawn | 5 cgr. stovaine | Laid on back no elevation | (1) 5 mins.<br>(2) 10 mins.<br>(3) 15 mins. | Analgesia in perinæum and penis | Excellent .. | Analgesia in perinæum, 60 mins. Slight headache. No vomit. Capt., W. I. R., assisting. |
| 17.2.08. Male, 36 years | Pte. Green, 1st W.I.R. | Septic wound, left leg | Lying left side ; 1st puncture failed, 2nd puncture easy | 3rd space ; 1 cc withdrawn | ,, | Pelvis raised 2 in. while on left side | (1) 3 mins.<br>(2) 10 mins.<br>(3) 25 mins. | Umbilicus on left side | ,, .. | Analgesia in left foot, 70 mins. Slight headache. No vomit. Capt., W. I. R., assisting. |
| 25.2.08. Male, 20 years | Pte. Sylvester, 1st W.I.R. | Hæmorrhoids | Sitting up ; 1st puncture failed, 2nd puncture easy | 2nd space ; rapid flow, 3 cc. withdrawn | ,, | Laid on back, pelvis raised 2 in. for 1 min. | (1) 3 mins.<br>(2) 8 mins.<br>(3) 20 mins. | Umbilicus | ,, .. | Analgesia in toes, 65 mins. Severe headache same evening. No vomit. Alright in 24 hours. Native orderly assisting. |
| 1.4.08. Male, 20 years | Pte. Sourri, W.A.R. | Hernia, right inguinal | Sitting up ; easy | 2nd space ; good flow, 3 cc. withdrawn | ,, | Laid on back, pelvis raised 4 in. for 4 mins. | (1) 4 mins.<br>(2) 8 mins.<br>(3) 55 mins. | Xiphisternum | ,, .. | Analgesia in toes, 90 mins., in wound, 60 mins. No headache. No vomit. Operator, Capt. Lauder, R.A.M.C. |

TABLE FOR SPINAL ANALGESIA—*Continued.*

| Date, sex and age | Rank and name | Operation | Position of patient during injection. Puncture easy or not | Site of puncture, and amount of spinal fluid withdrawn | Amount of stovaine solution injected | Position of patient after puncture. Pelvis raised or not | Time from puncture : (1) To analgesia (2) To beginning of operation (3) To end of operation | Maximum height of analgesia | Condition of patient during operation | Duration of analgesia and after-effects in ward |
|---|---|---|---|---|---|---|---|---|---|---|
| 25.5.08. Male, 29 years | Gnr. Walker, R.G.A. | Removal inguinal glands (right) | Lying right side; easy | 2nd space; good flow, 5 cc. | 5 cgr. stovaine | Laid on back, pelvis raised 2 in. for 2 mins. | (1) 2 mins.<br>(2) 5 mins.<br>(3) 15 mins. | Umbilicus | Excellent .. | Analgesia, 70 mins. Slight headache same afternoon. No vomit. Operator, Capt. O'Gorman. |
| 8.6.08. Female, 25 years | Mammy Fatmatta | Intestinal obstruction | Sitting up; easy | 3rd space; good flow, 5 cc. | 5·5 cgr. stovaine | Laid on back, pelvis raised 4 in. for 3 mins. | (1) 3 mins.<br>(2) 10 mins.<br>(3) 45 mins. | Nipple line | ,, .. | Analgesia, 105 mins. No headache. No vomit. Operator, Dr. Mayhew. |
| 11.6.08. Female, 40 years | Mammy Stuart | Hysterectomy | Sitting up; difficult; 3rd puncture easy | 3rd space; good flow, 5 cc. | ,, | Laid on back, pelvis raised 3 in. throughout operation | (1) 3 mins.<br>(2) 10 mins.<br>(3) 90 mins. | Xiphisternum | ,, .. | Analgesia, 110 mins. No headache. No vomit. Operator, Dr. Mayhew. |
| 18.6.08. Female, 40 years | Mammy Coker | Hysterectomy | Lying left side; 2nd puncture easy | 2nd space; slow flow, 5 cc. | 1st puncture 5 cgr. stovaine did not all reach sac. 2nd puncture 4·5 cgr. stovaine | Remained on side, pelvis raised 4 in. for 4 mins. | (1) 4 mins.<br>(2) 10 mins.<br>(3) 120 mins. | Nipple line both sides when turned on back | Excellent for 50 min. | Analgesia, 50 mins. in wound, then chloroform given lightly at end of operation. No headache. No vomit. Operator, Dr. Mayhew. |
| 23.6.08. Female, 30 years | Mammy Smith | Uterine tumour | Lying left side; easy | 2nd space; good flow, 5 cc. | 5 cgr. stovaine | Laid on back, pelvis raised 4 in. for 6 mins. | (1) 2 mins. in groin, 10 mins. to umbilicus<br>(2) 15 mins.<br>(3) 40 mins. | Umbilicus | Excellent .. | Analgesia, 60 mins. No headache. No vomit. Operator, Dr. Mayhew. |
| 25.6.08. Female, 15 years | Minnie | Resection intestine | Lying left side; easy | 2nd space; good flow, 3 cc. | ,, | Laid on back, pelvis raised 4 in. for 4 mins. | (1) 4 mins.<br>(2) 8 mins.<br>(3) 60 mins. | Nipple line | ,, .. | Analgesia, 60 mins. No headache, No vomit. Operator, Dr. Mayhew. |

# PREVENTION OF VENEREAL DISEASE.

By Captain J. DORGAN.

*Royal Army Medical Corps.*

The attached charts and tables show the incidence of venereal diseases among the British garrison in Poona for several years. The decrease in these diseases during the three years ending 1906 was so remarkable, and directly coincident with certain precautionary measures adopted during this period, that I hope they may be of interest.

| Years | Average strength | Venereal yearly admissions | Venereal constantly sick | Average monthly admissions | Ratio admissions per 1,000. |
|---|---|---|---|---|---|
| 1900-1-2-3 | 2,125 | 833 | 68.57 | 70 | 390 |
| 1903 | 2,353 | 980 | 76·27 | 81·6 | 418 |
| 1904 | 2,071 | 492 | 41·43 | 41·4 | 238 |
| 1905 | 2,099 | 264 | 18·46 | 18·4 | 129 |
| 1906 | 1,903 | 134 | 12 | 11 | 70 |

Preventive measures were commenced in February, 1904. Poona had been for many years notorious as being the worst station of any appreciable size in India, as regards the prevalence of venereal disease. The causes of this were :—

(1) It is a large civil as well as military station, and also is the headquarters of racing in Western India, there being about 300 horses in training and 30 large race meetings held annually.

(2) Its short distance from Bombay (three hours) and its pleasant climate cause it to be much frequented by all classes from that city.

(3) It is indistinguishably united to the large native city of Poona (100,000).

(4) A very large number of men (about 150) are temporarily attached to the station undergoing courses of instruction in mounted infantry, signalling, gymnastics, cooking, telegraphy, railway work, &c. The Central Military Prison also gives many admissions; as do many men who come to spend their furlough in Poona.

Poona, therefore, in many respects resembles a home garrison town, and as such, sanitary measures are more difficult than in the isolated up country stations. The British garrison of Poona consists of two regiments, and as a rule, it is a three years station. Both regiments under observation arrived in October, 1903, and remained throughout the three years.

The 93rd Highlanders occupied Wanowri lines and the 2nd East Lancashire Regiment the Ghorpuri lines; they were separated by a distance of over a mile, and at somewhat the same distance from both regiments was the main sudder bazaar of the cantonment. Adjacent to each barracks were the large regimental bazaars. The soldiers of each regiment, as a rule, confined themselves to their own bazaar, as they could go there without being in walking out dress, but in the evenings the sudder bazaar was much frequented. In it were the houses of the European prostitutes.

On taking charge of the Cantonment Hospital in January, 1904, owing to the excessive prevalence of venereal disease among the 93rd Highlanders, I first attempted supervision in the Wanowri regimental bazaar. In three months the venereal constantly sick of this regiment had fallen to ten from the previous figure of sixty. This was maintained and improved upon during the next few years, the average daily rate being five or six.

Owing to local feeling and other reasons, I was unable to take similar action in Ghorpuri bazaar, and the disease in the 2nd East Lancashires continued to rise. The bazaar was put out of bounds as far as possible pending further action, and I directed attention to the sudder bazaar, being encouraged by the definite results in the 93rd Highlanders. Here supervision was difficult for many reasons, and it was several months before things were properly in line.

It was not until January, 1905, that I was able to take measures regarding Ghorpuri bazaar, but when once adopted here the result was the same as in Wanowri, the average venereal constantly sick of the 2nd East Lancashire Regiment, though never excessive, was reduced to three or four, and the improvement was maintained.

The measures adopted were mostly in accordance with the Indian Cantonment Code; they included weekly or fortnightly examinations, and detention of all suspicious cases in hospital. At the early inspections several most virulent types of syphilis were detected. These were mostly treated in hospital for long periods, my hospital, though equipped with only thirty beds, being obliged to accommodate fifty women patients. The remaining healthy women were permitted to remain in certain specified houses, under the control of a matron responsible for their freedom from infection, and who assisted in the detection of suspects. Antiseptic lotions were provided and regularly used.

Wayside prostitution was prevented rigidly, and the recognised women were zealous to report all such interference with their monopoly by outsiders, though this was a means of infection which it was long difficult to control.

Table I. shows the incidence of the various forms of venereal diseases in Poona. In 1903, primary and secondary syphilis being removed from the nomenclature, both diseases were afterwards included under one head. It may be noted here that only two cases of primary syphilis were contracted at Poona during 1905 and 1906.

TABLE I.—ADMISSIONS FROM VENEREAL DISEASES FROM 1897-1906.

| Year | Primary syphilis | Secondary syphilis | Syphilis | Soft chancre | Gonorrhœa | Total | Average strength | Ratio per 1,000 |
|---|---|---|---|---|---|---|---|---|
| 1897 | 136 | 184 | 320 | 198 | 377 | 855 | 1,985 | 431 |
| 1898 | 89 | 111 | 200 | 349 | 298 | 847 | 1,904 | 445 |
| 1899 | 63 | 118 | 181 | 106 | 282 | 569 | 1,884 | 302 |
| 1900 | 165 | 147 | 312 | 109 | 411 | 832 | 2,178 | 382 |
| 1901 | 179 | 100 | 279 | 167 | 432 | 878 | 2,091 | 420 |
| 1902 | 27* | 74 | 101* | 226 | 317 | 644 | 1,879 | 343 |
| 1903 | 112 | 114 | 226 | 267 | 487 | 980 | 2,353 | 416 |
| 1904 | — | — | 115 | 150 | 227 | 492 | 2,071 | 238 |
| 1905 | — | — | 35 | 127 | 102 | 264 | 2,099 | 124 |
| 1906 | — | — | 10 | 50 | 74 | 134 | 1,903 | 70 |

* Plus 89 ulcerated penis.

I have collected in Table II. the admissions from what I have called "allied venereal diseases." They include what I considered admissions which were in many cases venereal in origin. The table shows a corresponding reduction, which would prove the absence of concealed disease to any extent. I may mention that any cases of concealment were severely dealt with, and were continually being sought for as a part of the prophylaxis against infection.

TABLE II.—ADMISSIONS OF ALLIED VENEREAL DISEASES FROM 1900-1906.

| Year | Ulcerated penis | Orchitis | Inflammation of groin | Total allied diseases | Venereal admissions | Total |
|---|---|---|---|---|---|---|
| 1900 | 14 | 14 | 62 | 90 | 832 | 922 |
| 1901 | 18 | 14 | 60 | 92 | 878 | 970 |
| 1902 | 89 | 12 | 47 | 148 | 644 | 792 |
| 1903 | 12 | 13 | 78 | 103 | 980 | 1,083 |
| 1904 | 2 | 13 | 55 | 70 | 492 | 562 |
| 1905 | — | 8 | 17 | 25 | 271 | 321 |
| 1906 | — | 6 | 23 | 36 | 134 | 170 |

Chart 1 shows the average monthly admissions and average constantly sick suffering from venereal diseases before and during the adoption of preventive measures. The venereal cases in hospital in 1906 each day show a reduction of fifty-seven from the corresponding numbers on four years before the preventive measures were adopted.

Chart 2 shows the actual monthly admissions and the actual numbers in hospital with venereal disease on the first Monday of each month during three years. It shows an annual curve of increased incidence during the winter months. This is due to the admissions for chancres, which occur in increased numbers during these months; in fact, for the three years I noted practically a complete absence of sores of any sort during the months of April to October. It is remarkable in that it recurred during the three years I had an opportunity of observation. I have been unable to trace the cause; it may be due to want of cleanliness during the winter months, and to the fact that many men contract disease outside the station, in camps of exercise and manœuvres.

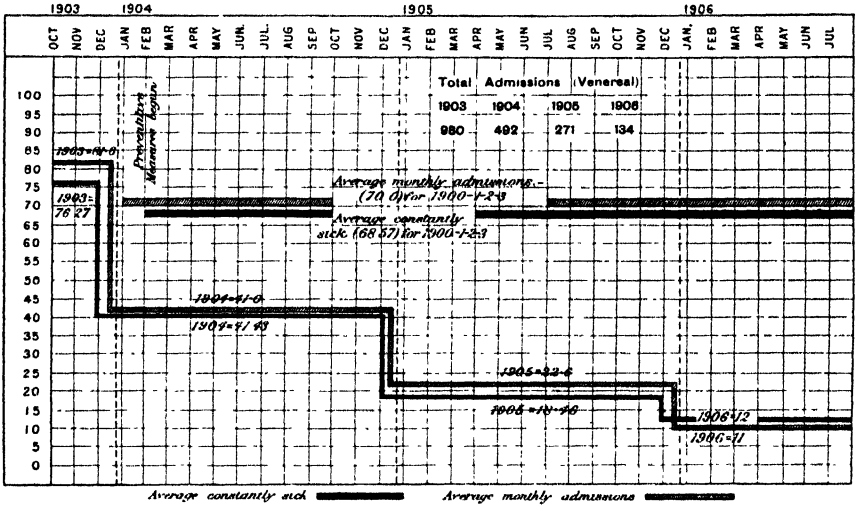
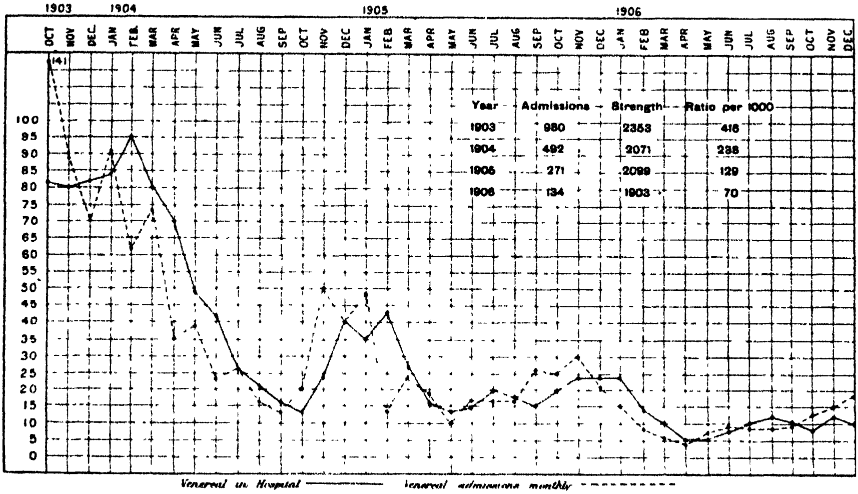


CHART 1.

### NOTE ON THE TREATMENT OF SYPHILIS.

Though I treated syphilis largely by the intramuscular method, I attribute the reduction in this disease to this form of administering mercury only to a small extent. I had over 150 cases on my register, and 90 of these I have had under my intimate continuous observation for three years, and have given to them over 5,000 injections of mercury. My experience has been, then, in many respects unique in the Service, inasmuch as few of us have opportunities of watching such a body of syphilitic cases for such a continuous period. I had one abscess in a man undergoing a course of instruction in mounted infantry. It was rare to find any man unwilling to undergo the treatment. I never saw the least constitutional ill-effects, and in fact, rarely, if ever, did I notice any definite manifestation of the absorption of the drug. All my cases did well, and none required invaliding.



| Year | Admissions | Strength | Ratio per 1000 |
|---|---|---|---|
| 1903 | 980 | 2353 | 416 |
| 1904 | 492 | 2071 | 238 |
| 1905 | 271 | 2099 | 129 |
| 1906 | 134 | 1903 | 70 |

CHART 2.

Many of my cases (65 per cent.) did well under the injection treatment, but they were all cases who had received a thorough preliminary hospital treatment by inunction or hydrarg. excreta, as I never used the injection treatment for patients in hospital, and some volunteered to take medicine outside, which I know they actually did, in addition to the injections. Yet I can by no means feel satisfied regarding their cure. I believe most of these groups of cases, after their preliminary saturation with mercury, would have shown no sign of the disease during the time I had them under observation (three years). Who can speak with any certainty of the prospects of the cure of the disease and of the results twenty years after?

The remainder of my cases showed definite relapses whilst under injections, and I had been giving to all large doses, nearly always more than 2 grains per week. Some had forty and even seventy injections before they showed symptoms. My routine was to supplement the dose by the oral method, or to admit them to hospital and press the dose to the tolerant limit by inunction or hydrarg. c̄ creta. I maintain that this tolerance could not with safety be approached by injection, knowing, as we do, that the next dose may lead to serious, if not fatal, results. This fact must always remain a definite objection to the logical treatment of the disease by injection alone. In the Service at the present time the dose has practically become a routine one, and, in my opinion, a minimal one. Is it not possible, then, that we may be depending too much on the sufficiency of the injection method of treatment, and that the freedom from, or infrequency of secondary manifestations after a routine series of injections of so many grains of mercury, may be leading to a false impression regarding the completeness of the cure?

It is claimed as the advantage of the injection method that we can be sure that our patient has actually had his dose of so many grains of mercury; yet, considering the well-known idiosyncrasy of patients to mercury in syphilis, this advantage must only be considered as one of expediency in the treatment of the soldier, and cannot compare with the safety and ease with which we can definitely approach the adequate and tolerant dose by the older methods: the actual weight of mercury which it has taken to produce this effect need not be known or considered.

It is with much diffidence that I record this personal opinion regarding the now recognised method of treatment by injection. I may, however, say that it was formed without bias after close and enthusiastic study of a considerable number of cases continuously under my care. While believing that injection in combination with other methods of treatment is the best for the soldier treated out of hospital, I would make a plea for more elasticity in our treatment of individual cases of syphilis, and a plea for the reconsideration of the question of an absolute cure of those cases whose regulation injections have been given and recorded, and whose sheets have been disposed of after a year's freedom from symptoms. Putting ourselves in the patient's position, would we rest satisfied that our cure was complete?

# THE EXAMINATION OF WATER ON FIELD SERVICE.

By Captain R. T. BROWN.

*Royal Army Medical Corps.*

The methods for the examination of water which we have at our disposal when on field service are inspection, chemical analysis, and bacteriological examination. Any one of these methods alone is insufficient.

The chemical examination is difficult, owing to the large amount of material required; and though this may be avoided by the use of one of the portable cases of reagents for water examination now on the market, we have still to remember that, in whatever way it is carried out, this form of examination is very unreliable. Its unreliability has been shown when testing surface wells,[1] which would constitute a large percentage of the waters to be examined in the field, and probably holds good for other surface waters. Inspection alone is frequently quite insufficient for the purpose of determining if a well is contaminated and if it should be closed.[1]

With present-day knowledge, the most reliable opinion upon a water supply can be obtained from inspection with bacteriological examination of the supply. For field-service work, the ordinary bacteriological examination does not give results with sufficient quickness to make it an ideal procedure. The object of the present paper is to describe a method by means of which reliable bacteriological results can quickly be obtained. The method will first be described, then the actual results obtained, and a comparison of these results will be made with more deliberate bacteriological examination under ordinary laboratory conditions. The value of the method depends upon the answer to the question, How far lactose fermentation may be taken as a rough-and-ready index of excretal contamination and the presence of *Bacillus coli?*

*Apparatus.*—The apparatus used consists of:—

(1) Corked 2-ounce bottles containing lactose medium and enclosed test tube; (2) sterilised plugged test tubes (small) containing a small test tube; (3) incubator; (4) stand for incubator; (5) oil lamp with chimney; (6) thermometer (100° C.); (7) thermometer (clinical); (8) lead sinker for bottle; and (9) fishing-line (graduated).

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[1] Savage, "The Bacteriological Examination of Surface Wells," *Journal of Hygiene*, vol. vii., No. 4, June, 1907.

*Bottles.*—The bottles, fig. 1, are 2-ounce phials, washed with soft soap and hot water, boiled for one hour in 2 per cent. cresol solution, and steamed for one hour. The corks are new and are rapidly dipped in collodion, a second coating being given when the first is dry. The small inner tubes are made of glass tubing 2 inches long and sealed at one end. The bottle is graduated, after addition of the tube, by filling with water to the commencement of the neck (A). This amount is measured—say 70 cc.—and 10 cc. subtracted. This amount—here 60 cc.—is put into the bottle and a file mark made at its level (B); 40 cc. are then subtracted from this, and the remainder—here 20 cc.—put back and its level marked (C). The nutrient medium is taurocholate-lactose-litmus-peptone water, and is made of such a strength that when the quantity in the bottle up to mark (C) is added to 50 cc. of the sample water, the resulting strength is: Taurocholate of soda, 0·5 per cent.; peptone, 2 per cent.; and lactose 1 per cent. Sufficient neutral litmus is added to colour the medium. The bottles are filled with medium to (C), and corked with the collodion-coated corks, which are tied in with string. They are then sterilised in the steamer for twenty minutes on three consecutive days. After four months the medium in the bottles remains sterile.

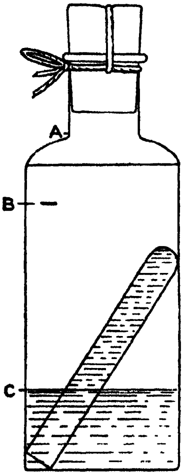

Fig. 1.

*Test Tubes.*—Only small tubes, to hold the 10 cc. of water, are required.

*Incubator.*—The incubator is made of two tins (*vide* fig. 2). The outer tin has a covering of felt or spongio-pyline. I use lead, fixed to the bottom of the inner tin, to keep it down when immersed in water. This makes the apparatus too heavy, and a preferable arrangement would be a light iron bar (figs. 2 and 3), which lies over the cover of the inner tin and has a hole in it through which the thermometer-holder passes. It goes under two iron flaps which are riveted to the inside of the outer tin. As the water is poured into the space between the two tins the inner tin rises, and the upward pressure is so great that the bar is firmly fixed under the flaps. In this way there is a water space between the bottom and sides of the tins, and the inner tin is sufficiently immobile.

*Incubator Stand.*—This is a three-legged iron stand of such a height that the chimney of the lamp is ¼ in. from the bottom of the incubator.

*Lead Sinker.*—The lead sinker is a piece of roll lead (figs. 4 and 5) cut with tapering ends, and so affixed to the bottles that one end partly encircles and fixes the neck while the other crosses the bottom. Two holes are made in the lead to take a loop of cord or wire.

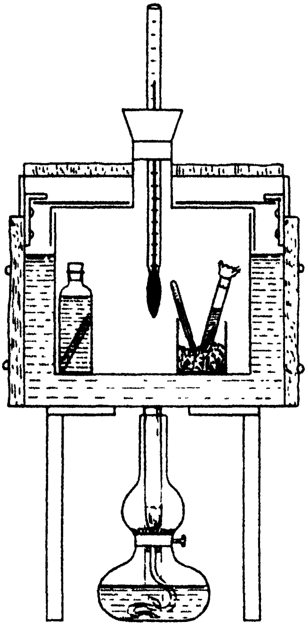

FIG. 2.

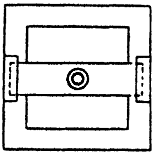

FIG. 3.

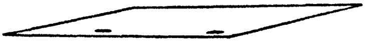

FIG. 4.

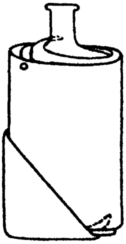

FIG. 5.

*Fishing-line.*—This is of hemp, and it facilitates matters if it is kept on a reel. The line should be marked by knots at distances of 1 foot. By this means the quantity of water in a well can be ascertained after the sample has been taken.

*Method of Procedure.*—(*a*) *At the Water Supply*, e.g., *Well*: Fix the bottle in the lead and attach the line. Remove the cork, taking care not to let it touch anything, and quickly lower the bottle well under the surface of the water. Raise the bottle, pour out the two or three upper drops to base of neck (A), re-cork bottle and gently shake the contents; (*b*) *At the Temporary Laboratory*: Flame the cork and neck and pour out 10 cc. from (A) to mark (B)

| "PRESUMPTIVE" TEST | | | | | | LABORATORY EXAMINATION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LACTOSE | | | | GELATINE | | | LITMUS MILK | | | | | | | | |
| | | 40 cc. | | 10 cc. | | | | | | | | | | | | | |
| Sample | Source | 24 hours | 48 hours | 24 hours | 48 hours | Growth | Motility | Lique-faction | Acid and clot | Days to clot | Lactose | Glucose | Mannite | Starch | Neutral red | Indole | Remarks |
| 1 | Ditch by watercress bed, midden within 30 feet | + | .. | + | .. | Smooth, bluish, translucent growth | + | – | + | 1 | + | + | + | – | + | + | "Excretal" *coli.* |
| 2 | Watercress bed below artesian wells | – | + | – | – | Tough, wrinkled, semi-translucent growth | + | – | + | 1 | + | + | + | – | + | + | *B. sulcatus gasoformans.* |
| 3 | Watercress bed above artesian wells | – | + | – | – | Tough, wrinkled, semi-translucent growth | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 4 | Drain by camp, polluted .. .. | + | .. | + | .. | Smooth, bluish, translucent growth | + | – | + | 1 | + | + | + | – | + | + | "Excretal" *coli.* |
| 5 | Stream below the bathing pool .. | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 2 | + | + | + | – | + | + | ,, ,, |
| 6 | Stream above the bathing pool .. | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 7 | Stream (5 and 6) half mile above camp | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 8 | Drinking-water tank in camp .. | – | – | – | – | No "excretal" or *coli*-like organisms isolated. | | | | | | | | | | | |
| 9 | Filter-cart, filtered water .. .. | – | – | – | – | ,, ,, ,, ,, ,, | | | | | | | | | | | |
| 10 | Filter-cart, filtered water .. .. | – | – | – | – | ,, ,, ,, ,, ,, | | | | | | | | | | | |
| 11 | Filter-cart, unfiltered water .. | + | – | – | – | White growth, not like aerogenes.. | – | – | + | 3 | + | + | + | – | p.[1] | – | *Coli*-like. |
| 12 | Filter-cart, filtered water .. .. | – | – | – | – | No "excretal" or *coli*-like organisms isolated. | | | | | | | | | | | |
| 13 | Filter-cart, unfiltered water .. | + | .. | + | .. | Smooth, bluish, translucent growth | + | – | + | 1 | + | + | + | – | + | + | "Excretal" *coli.* |
| 14 | Surface well below stable and pig-styes | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 15 | Shallow well in garden, bricked and covered | + | .. | – | – | ,, ,, ,, ,, | + | – | + | 2 | + | + | + | – | + | + | ,, ,, |
| 16 | Pond by roadside .. .. .. | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 17 | Stream by road, cottage 200 yards above | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 2 | + | + | + | – | + | + | ,, ,, |
| 18 | Shallow well in garden, bricked, loose cover | + | .. | – | + | ,, ,, ,, ,, | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 19 | Upland stream, shallow, sluggish, decaying vegetation | + | .. | + | .. | ,, ,, ,, ,, | + | – | + | 1 | + | + | + | – | + | + | ,, ,, |
| 20 | Upland stream, fast, clear .. .. | + | .. | + | .. | Tough, wrinkled, semi-translucent growth | + | – | + | 1 | + | + | + | – | + | + | *B. sulcatus gasoformans.* |
| 21 | Filter-cart, filtered water .. .. | – | – | – | – | No "excretal" or *coli*-like organism isolated. | | | | | | | | | | | |
| 22 | Upland stream, large, above 19 and 20 | + | .. | – | + | Smooth, white, semi-translucent growth | + | – | + | 4 | + | + | + | – | + | – | *Coli*-like organism. |
| 23 | Filter-cart, unfiltered water .. | + | .. | + | .. | Smooth, bluish, translucent growth | + | – | + | 1 | + | + | + | – | + | + | "Excretal" *coli.* |
| 24 | Drinking water stand-pipe in camp | + | .. | – | – | ,, ,, ,, ,, | + | – | + | 3 | + | + | + | – | + | + | ,, ,, |
| 25 | Filter-cart, filtered water .. .. | – | – | – | – | No "excretal" or *coli*-like organism isolated. | | | | | | | | | | | |
| 26 | Surface well at spring-head, no contamination evident | + | .. | – | – | Smooth, bluish, translucent growth | + | – | + | 9 | + | + | + | – | + | + | "Excretal" *coli.* |

[1] p. = partial.

into a sterile test tube. It is much better to measure the 10 cc. by means of a sterile pipette if possible. Incubate the test tube (holding 10 cc.) and the bottle (holding 40 cc.) at a temperature as near 37° to 42° C. as possible. The minimum temperature is of less importance than the maximum, which should not exceed 42° C. or 107·6° F., as shown by the clinical thermometer left in the incubator. The incubation should be for forty-eight hours, and a positive reaction is shown by the presence of acid and gas in the water and medium.

*Comparison of "Presumptive" Test with Laboratory Examination.*—The results are shown in the table.

*Comparison of the "Presumptive" Test with the Actual Isolation of* B. coli.—A summary of the table shows that twenty samples gave lactose fermentation, and that *B. coli*, or a closely allied organism, was isolated from seventeen of them. Of these seventeen, fifteen were "excretal" *coli* and two were *coli*-like. Of the three samples which gave lactose fermentation, but from which I was unable to isolate *coli* or *coli*-like organisms, each showed the presence of *B. sulcatus gasoformans.*[1] Two of these were from watercress beds and one from an upland stream, all of which were liable to contamination. Six samples showed no lactose fermentation, and I was unable to isolate "excretal" *coli* or *coli*-like organisms from any of them.

Note.—The term "excretal" *coli*[2] is for an organism with the following characters:—(*a*) *Gelatine slope.*—Bluish, translucent, smooth growth; visible in twenty-four hours, and which remains unaltered on two weeks incubation. (*b*) *Litmus milk at* 37° C.—Permanent acid fermentation and coagulation within a few days. (*c*) *Lactose peptone litmus solution.*—Fermentation with acid and gas production. (*d*) *Peptone water.*—Indol present after five to seven days incubation. (*e*) *Neutral-red broth.*—Fluorescence produced.

*Comparison of "Presumptive" Test in* 10 *cc. and in* 40 *cc. of water.*—Of the twenty samples giving lactose fermentation, fourteen gave the reaction in 10 cc.; all these waters were liable to contamination. Twelve subsequently gave "excretal" *coli*, one gave *coli*-like organisms, and one showed *B. sulcatus gasoformans.* Five reacted *only* in 40 cc. The contamination was probably slight and local, or surface, or largely diluted with good water. No. 11 was from a water-cart, which was liable to varying pollution according to the source of its water. "Excretal" *coli* were isolated from 40 cc. No. 26 was from a covered and cemented chamber which collected the water from the spring-head by means of a small pipe in the hill-side. There was no evidence of contamination. "Excretal" *coli* were isolated from 40 cc. No. 24 was from a drinking-water stand-pipe in camp. "Excretal" *coli* were isolated from 40 cc. The water was from a deep well in the chalk, which gave an excellent bacteriological finding. Nos. 2 and 3 were from watercress beds and close to a spot where three artesian wells were mixing quantities of pure water with the water from the stream which fed the beds, and which was liable to, at any rate, surface pollution. They showed *B. sulcatus gasoformans* present in 40 cc.

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[1] Horrocks, "The *Bacillus coli communis*, considered as an Indicator of Sewage Contamination of Water Supplies." JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. i., p. 362.

[2] Savage, "Bacteriological Examination of Water Supplies," p. 226.

*Dealing with the Comparison between the Results of Inspection and the Presence of Lactose Fermentation.*—There is a close agreement between the two. There was no evidence of contamination on inspection in eight samples, of which two gave lactose fermentation in 40 cc. No. 26 was the surface well before mentioned, and No. 24 was from a drinking-water stand-pipe, also mentioned before. In both of these the contamination was, probably, slight and local, and neither fermentation nor *coli* was present in 10 cc.

There was evidence of possible contamination on inspection in eighteen samples, and all of these showed lactose fermentation in 40 cc. Five were obviously polluted ; lactose fermentation was given, and "excretal" *coli* were isolated from 10 cc. of them all. Three were from unfiltered water in filter-carts. Lactose fermentation was present, and "excretal" *coli* were isolated from 10 cc. of two and from 40 cc. of the other. Eight were from streams not obviously polluted, but liable to contamination. Lactose fermentation was given, and *B. coli* was present in 10 cc. of five. *B. sulcatus gasoformans* was present in the remaining three, one in 10 cc., and two in 40 cc. Of these last three, two (Nos. 2 and 3) were largely diluted with good water, and one (No. 22) was a large stream above the opening of the contaminated waters. The remaining two were from shallow wells in gardens. The wells were lined with bricks, but had no impervious steining. The one with a wooden cover showed "excretal" *coli* and lactose fermentation only in 40 cc. The one with a badly-fitting cover, and which was close to a pail closet, showed "excretal" *coli* and fermentation in 10 cc.

I have to thank Dr. Savage for several suggestions in adopting the method for field service work.

*Conclusions.*—(1) That there is a close correspondence between inspection and lactose fermentation. (2) That the presence of lactose fermentation in 10 cc. points to serious pollution. (3) That the presence of lactose fermentation in 40 cc. only is not sufficient to condemn a water, but points to the need of further investigation, since it may be due to only slight local or surface contamination. (4) That for field service work the above presumptive method is of great value in judging as to the potability of water supplies, and, together with inspection of the sources, is sufficient to enable a reliable opinion to be given as to the suitability of the supply for troops.

# A NOTE UPON BLACKWATER FEVER; ITS TREATMENT AS SEEN IN NYASALAND (THE HEARSEY TREATMENT), WITH SUGGESTIONS ON CAUSATION AND PROPHYLAXIS.

By Captain F. HALLAM HARDY.
*Royal Army Medical Corps.*

The following notes upon blackwater fever and its treatment may be not without interest to the readers of the Journal. While not bringing forward anything novel in treatment, yet as the various text-books supply so little information, and that largely second-hand, as to the most suitable line of treatment, I thought that perhaps a description of the methods in vogue here, which have proved so successful of late years, might be of service to those of my brother officers who have cases to deal with.

During the last ten years, during which I have served three tours in this country, I have had the opportunity of observing many lines of treatment.

This disease was formerly both a dreaded and deadly one, with a mortality that may be gathered from the following table:—

| | Number of cases | Number of deaths | Mortality per cent. |
|---|---|---|---|
| 1897 .. | 35 .. | 16 .. | 45·7 |
| 1898 .. | 27 .. | 9 .. | 33·3 |
| 1899 .. | 29 .. | 11 .. | 37·9 |

Or roughly, a mortality of 1 in 3.

Treatment was of many kinds. Usually quinine was given in large doses, with plentiful administration of champagne and beef extract "to keep up the strength." I am convinced that cases succumbed to this well-meant over-stimulation, and the Principal Medical Officer attributed one death in a case treated on these lines to collapse following acute indigestion. Then one practitioner, on grounds known to none save himself, used injections of pig bile (to counteract the bilious vomiting) with 7 to 10 minims of turpentine every two hours by the mouth. The effect of the latter upon a kidney already inflamed need not be described. Copious libations of gin and water were also praised by some, and many of these cases did well. Finally, in a circular emanating from London, cantharides in minim doses of the tincture was recommended, one case having recovered under this treatment.

Such was the unsatisfactory nature of the treatment and its results when in 1899 Dr. H. Hearsey, one of the medical staff (who is now Principal Medical Officer), introduced a new line of treatment, which has proved so successful that the name blackwater fever has been robbed of many of its terrors; and this from the mental point of view, in a severe case, alone means a great deal in coping with it.

The treatment adopted is as follows: As soon as possible after the onset of the disease, calomel, with ¼ of a grain of morphia hypodermically to allay restlessness and vomiting, is given, the patient is wrapped in blankets, and hot-water bottles are put in the bed. An hourly dose of a mixture containing liq. hydrarg. perchlor. ♏xxx. and sodæ bicarb. gr. x. to a tablespoonful of water is given for the first twenty-four hours, and every two hours subsequently, until the urine clears. No food is given for the first twenty-four hours unless there is an inclination for it on the patient's part and an absence of vomiting. The food which I usually give is: (1) Small quantities of milk and soda; (2) small quantities of freshly-made chicken broth; (3) small quantities of white wine whey. *Barley water is given ad libitum,* and the patient encouraged to drink it. Acid drinks, such as lemonade, and champagne and hock, are absolutely prohibited. If alcohol towards the latter part of the illness is required, brandy or whisky is the only form in which to exhibit it. Beef extracts and essences are also strictly forbidden, and no quinine is administered. Digitalis is given if necessary.

I have discussed the treatment with a German military surgeon in German East Africa, and he tells me that quinine is forbidden in these cases, and that they rely upon copious libations of toast water, with excellent results. Unfortunately, I could not obtain any statistics.

The results of this method of treatment have been surprising. The mortality at once fell, and Dr. Hearsey was able to report a series of twenty-one cases without a death; good results have been obtained by other practitioners. Suppression of urine, at one time a fairly common termination, has become an extremely rare one, and the severe vomiting, which was one of the most distressing features of an attack, is not now often met with.

I append the figures for the last year for which these are available.

One case brought in dead is not entered in the following table.

TABLE OF CASES OF BLACKWATER FEVER IN NYASALAND, 1906-1907.

| No. of cases | Recovered | Treatment | Mortality per cent. |
|---|---|---|---|
| 15 | 15 | Hearsey's method .. .. .. | 0 |
| 2 | 1 | Other methods .. .. .. | 50 |
| 7 | 4 | No report of methods employed.. | 40 |

It has been suggested in some quarters that the type of disease as regards its severity has become milder. This is not the case. The mortality amongst cases treated in other ways is just as high as formerly, and I have failed to see any diminution in the "intensity" of this disease. By "intensity" I refer to the way in which attacks have a habit of dividing themselves, as regards duration, into multiples of twelve hours. Thus in a very slight attack the urine clears after twelve hours, a medium attack lasts forty-eight hours, and a case in which the hæmoglobinuria persists, in the absence of other complications, for seventy-two hours is regarded as an extremely severe one.

Amongst other points in treatment, the value of saline solution in severe cases must be referred to. This may be administered by intravenous, intracellular, or, as I find does very well, rectal injection. The only point to which I would refer is the advantage of increasing the amount of sodium bicarbonate to one or even two drachms per pint. It appears to me to have a decided influence for good. Another point, and one upon which too much stress cannot be laid, is the importance of *absolute recumbency* during the illness, and for at least seven days after. I know of two cases of fatal syncope, one whilst at stool and another during convalescence, from neglecting this precaution. *Hepatic pain*, often a symptom of this disease, should be treated by hot stupes (turpentine should not be employed). This hepatic pain occasionally recurs for months afterwards. *Vomiting* can best be controlled by very small injections of morphia.

*Invaliding.*—Formerly all cases were invalided, generally with the recommendation not to return to a blackwater fever country. I consider this invaliding to be a mistake, provided a complete recovery has been made, and the subject has an opportunity of getting away from his station, if in the enervating low country, for several months. There is likewise no reason to prohibit a return to the country from leave. This practice has been adopted here with complete success, and with no reason to regret it. With planters and traders the prohibition of return to the country, or even invaliding, is difficult to insist upon, as all their capital and interests are sunk here, and without abandoning them they are difficult to dispose of. I usually insist, however, that in the future quinine must be taken systematically.

It is a commonly recognised fact that the subject of an attack of blackwater fever, which is usually the culmination of attacks of malarial fever, is free from future attacks of fever for many months. In connection, however, with this statement, I would like to refer to the post-hæmoglobinuric fever which in some cases occurs during convalescence. In the last two cases in which I had an opportunity of making blood films during the pre-hæmoglobinuric stage, the parasites were all of the *malignant tertian* type. Both these cases developed " malarial fever " within a week of the urine becoming clear, and then the parasites were all of the *benign tertian* type, yielding readily to intramuscular injections of bihydrochloride of quinine, without untoward results. The occurrence of this fever has apparently been adduced as an argument against the "malarial" origin of blackwater fever, but until the fact that malignant tertian, benign tertian, and quartan are entirely different diseases is recognised, the causation of the disease cannot be understood.

*Prophylaxis of Blackwater Fever.*—There is a tendency amongst theoretical circles in England to endeavour to prove that this disease is distinct from, and independent of, malignant tertian fever. The word " malaria " itself is a most misleading one, as it comprises at *least* three distinct diseases, and until the various diseases grouped under malaria are separated under their various headings, confusion in discussing this and other problems will always occur. I can find no argument to support the contention that it may be due to a piroplasma (apparently argued from some fancied resemblance to piroplasmosis in cattle), or yet any argument against its being a complication of a severe malignant tertian infection. At the same time, the possibility, or even the probability, of the fact that under the name *Plasmodium falciparum* (Blanchard) are included two, if not more, species of plasmodium, should be borne in mind, infection with one of which may be the original cause of this disease. The arguments in favour of blackwater fever being a complication of malignant tertian fever may briefly be summarised as follows:—

(1) Blackwater fever is invariably preceded by malignant tertian fever, usually a sequence of relapses, occasionally a low continuous fever.

(2) Parasites can be found in every case in the pre-hæmoglobinuric stage, and to a lesser extent during the first few hours of the illness.

Stephens states that of ninety-five cases examined by competent observers, 95·6 per cent. had parasites on the day before the attack. In the last two cases (which have already been referred to) in which I was able to take films in the prehæmoglobinuric stage, malignant tertian parasites were present in numbers, disappearing within an hour or so after the appearance of hæmoglobinuria. The failure to find them during the illness is possibly due to the hæmolysis affecting the weakest (*i.e.*, infected) corpuscles at once.

The explanation of attacks of blackwater fever occurring in other malarial countries and in England, some time after the subject has left an endemic district, I believe to be this: Parthenogenesis takes place, the gametocyte reverts to the schizont form, afterwards sporulating and completing its endogenous cycle. The female gametocyte being very resistant to quinine, when this is discontinued, malignant tertian auto-infection takes place.

(3) In all cases I have seen the mononuclear count is a high one, over 20 per cent., which is a fairly conclusive test of a malarial infection.

(4) Indian natives (Sikhs and Traders) do not suffer from the disease as frequently as Europeans, the liability of incidence being roughly about one-quarter.

This appears to point to a partial immunity to the disease, while amongst the millions of African natives extremely few cases have been reported. As these natives all suffer from a chronic malignant tertian infection in childhood, it would appear that their freedom from blackwater fever is connected with this fact. I obtained statistics recently which showed that healthy native children on Lake Nyasa, under 7 years of age, showed malignant tertian parasites in their blood to the extent of 75 per cent. Moreover, natives from America and the West Indies suffer almost as badly as Europeans. Resistance to the malignant tertian parasite may also be partly hereditary. Amongst Europeans the liability to attack appears to diminish after five years residence.

(5) Blackwater fever follows in its distribution that of the malignant tertian fever very closely.

(6) *Systematic quinine-takers* enjoy a very high immunity from attack. (*Cf.* Plehn's figures in Clifford Allbutt's "System of Medicine.") In my opinion the "irregular" taking of quinine is to be highly condemned, being responsible for most, if not all, of the attacks of quinine hæmoglobinuria.

If, therefore, blackwater fever be considered to be a complication of malignant tertian fever (in the same way as hyperpyrexia or coma is), the causation may be expressed as follows:—

$$\left.\begin{array}{l}\text{Blackwater}\\\text{fever}\end{array}\right\} = \left\{\begin{array}{l}\text{Malignant tertian}\\\text{fever}\end{array}\right\} + \left\{\begin{array}{l}(a)\text{ Chill, wetting.}\\(b)\text{ Drinking bout.}\\(c)\text{ Quinine in an ``irregular'' quinine-taker.}\end{array}\right.$$

Bearing the foregoing facts in mind, the prophylaxis may be summed up as follows: *Prevent malignant tertian fever and avoid blackwater fever.*

The method of taking quinine varies; many prefer to take 5 grains daily, but in my own opinion it is better to take 1 gramme (15 grains) on every sixth and seventh day. This method is slowly being adopted here, with great success, and residents are finding out for themselves the benefits of this systematic administration.

A few points may be alluded to before closing. The spectroscopic examination of the urine in all cases of fever is advisable, methæmoglobin frequently appearing in small quantities before the actual onset, thus giving a timely warning. There seems to be an idea prevalent that subjects of kidney disease are those who suffer from blackwater fever. I cannot recollect the article, but one to that effect appeared recently in the *Indian Medical Gazette.* All cases of malaria that come under my care have the urine systematically examined, and in some of these hæmoglobinuria appeared. No signs of kidney mischief have been detected, and, with the exception of the irritative nephritis, caused by the passage of hæmoglobin, which passes off in seven to ten days, no signs of any lesion have been found, even at periods as long as eight years after an attack.

# ARMY ORGANISATION—A RETROSPECT.

By Lieutenant-Colonel W. A. MORRIS.
*Royal Army Medical Corps.*

It may not be generally known that the present organisation of the Territorial Army is but a turn of the wheel from the earliest periods of English history, and if a form of compulsory military training be adopted, the cycle will be nearly exact. The origin of military establishments in Britain is very old, and can be traced back at least to the Anglo-Saxon period, when every freeman of an age capable of bearing arms, and not incapacitated by disease or injury, was compelled to join the Army in the event of invasion by a foreign enemy, civil commotion, or any emergency endangering the peace and safety of the kingdom. This compulsory calling up of the manhood of the nation for the protection of the country was one of the three conditions comprised in the *trinoda necessitas*, which required "every man to attend personally in war for the defence of the kingdom; to work at and contribute to the building of the public castles and fortresses, and the repairing of highways and bridges."

In forming their armies at these times the head of each tithing controlled it. A tithing was an ancient subdivision of England, forming part of the hundred, and consisting of ten householders and their families held together in a society, all being bound for the peaceable behaviour of each other under a head, who was called the tithingman. Ten of these tithings formed the hundred, whose chief magistrate led his own soldiers; and the whole force of a county or shire was commanded by the Hertoch or Duke. The Hertochs, according to the law of Edward the Confessor, were the military commanders or leaders of the troops raised in every county or shire. They were selected from the principal nobility and such as were most remarkable for being *sapientes* (wise), *fideles* (faithful), and *animosi* (courageous). They had great power, and were selected by the people in their full assembly, at their Folkmote.

The forces under the Hertochs were led in war either by the King in person, or the King's Lieutenant or General. The latter office lasted only during the war.

There is a statute of the time of Edward I. which compelled every landowner to keep weapons and armour according to his rank and possessions, and to train his people to the use of arms at stated times in the year; and once a year a general inspection of arms was made throughout each county. The clergy were exempted from personal military service, but their estates were charged to the *trinoda necessitas*, the only imposition to which they were liable.

The Anglo-Saxon army consisted of infantry and cavalry. The latter was chiefly composed of Thanes—a Thane was a title of honour among the Anglo-Saxons. In England a freeman, not noble, was raised to the rank of Thane by acquiring a certain portion of land, by making three sea voyages, or by receiving holy orders. The Thane voted in the Witenagemot, not only of the shire, but also of the kingdom when important questions were discussed. At the time of the Norman Conquest, Thanes and barons ranked together till the reign of Henry II., when the title fell into disuse. The cavalry were then, as they were till later times, composed of persons with a competence, and are to be seen at the present day in the Yeomanry of the nineteenth century. This national force of cavalry and infantry, as far as we know, was first raised by King Alfred.

Upon the Norman Conquest, the feudal laws were introduced into this country, the whole of which was organised upon that military plan. All the lands of the kingdom were divided into knights' fees. It must be noted that the term "knight" only referred to those who held fees—a fee being two hides of land—and not to persons who had obtained the order of knighthood. The knight in possession of fees was obliged to hold himself in readiness with horse and arms to serve the King in his wars, either at home or abroad, at his own expense for a stated time, usually forty days in the year, and in consequence a force estimated at 60,000 men was always ready to obey the orders of the Sovereign. This course of military service in process of time became commuted into a pecuniary payment, and was finally abolished in the reign of Charles II.

The constitutional military force of England soon after the Conquest consisted of these feudal troops and the *posse comitatus* or power of the county, by which every freeman above the age of 15 and under 60 was liable at the command of the Sheriff to be called out in case of invasion to defend the country and repel the enemy, but as a rule they could not be marched out of the county, and in no case out of the country.

In the reign of Henry VIII., Lords Lieutenant and *Custodes Rotulorum* were appointed by the King under his Sign Manual, and these officers elected Clerks of the Peace. The Lords Lieutenant were representatives of the King to keep the counties in military order, and are mentioned in the time of Queen Elizabeth as extraordinary magistrates, constituted in times of danger.

In the reign of James I. a force partaking of the nature of both militia and volunteers was instituted. It was enrolled for the defence of the kingdom by the King and was solely at his disposal, and corresponded in strength according to the extent and population of each county. The force consisted of trained bands, and numbered about 120,000 men. They were abolished by Charles II. The term "trained band" was afterwards applied to the London Militia, from which the Buffs took their origin, and of which John Gilpin was a "Captain of renown."

Soon after the Restoration, when military and feudal tenures were abolished, it was considered advisable to ascertain the power of the Militia, to recognise the sole right of the Crown to govern and command them, and to put the whole into a more regular method of military subordination. In this way a National Militia was established and declared by Act of Parliament to be under the immediate orders of the King, who nominated the Lords Lieutenant of the counties, who in their turn appointed their Deputy Lords Lieutenant, who were bound to obey all the orders they received from their principal. Lords Lieutenant had authority to grant commissions in this force. This organisation lasted nearly one hundred years, but towards the end of the reign of George II. fresh attention was directed to the force, and an Act was passed for putting the Militia of the kingdom on a better footing and instituting a well-disciplined force: 30,740 men were ordered to be raised in the different counties of England and Wales. In 1780 this was augmented by the addition of one or more volunteer companies to the county regiment. In 1794 and 1796 further augmentations took place, and in 1798 they were called out and embodied; and from these regiments the standing army of the kingdom was increased by the Militia being allowed to volunteer with regiments of the line.

The Bill of Rights, 1689, and the Declaration of Rights were two Bills which constituted the Convention by which William and Mary were called to the throne, and are the basis of the conditions under which the crown of England is still held. The fourth article forbade the keeping of a standing army within the kingdom in time of peace, unless with the consent of Parliament. It was, however, at once required to subdue the adherents of James II., and has existed ever since; its pay, and consequently its strength, has remained entirely under the control of the Commons.

In 1870 the responsibility became vested in the Secretary of State for War, but the details of administration continued in the hands of a Commander-in-Chief. In 1902 the office of Commander-in-Chief was abolished and an Army Council appointed, whose actions are subject to the revision and control of the Secretary of State for War.

# FURTHER REPORT ON THE DISEASES OF THE TROOPS AND ANIMALS OF SIERRA LEONE.[1]

By Captain F. HARVEY.
*Royal Army Medical Corps.*

## TRYPANOSOMIASIS IN ANIMALS.

### *The Horse Experiment* 21 (*continued*).

THE details of this experiment, which were fully explained in the July number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, are now summarised in the form of a chart. The experiment is also illustrated by the three accompanying photographs; their comparison forms a striking contrast. The chart illustrates very graphically the position of the hæmoglobin percentage curve. As has already been explained, this curve was found to represent fairly accurately the blood-count index, taking 100 per cent. of hæmoglobin as the equivalent of five million red cells. Incidentally it may be remarked that the present condition of the horse's blood is somewhat over the average of normal animals in Sierra Leone, no doubt partly owing to the care and feeding, which the horse has received since the experiment began, being better than that to which it was accustomed when owned by the native chief. When

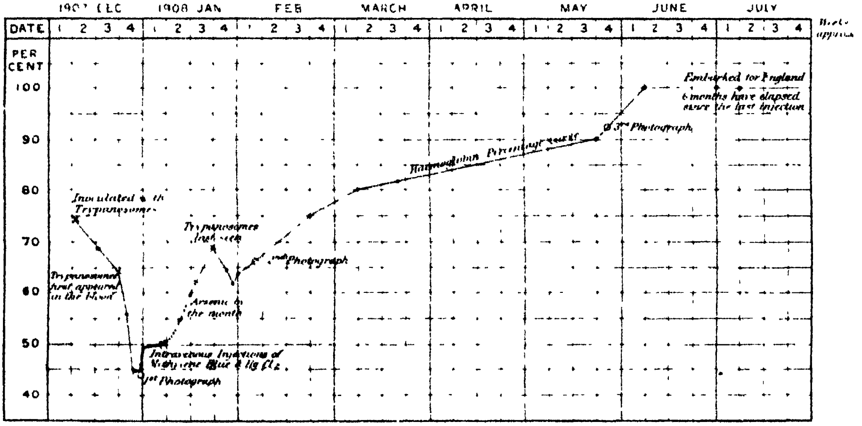

CHART ILLUSTRATING THE "HORSE EXPERIMENT" (No. 21).

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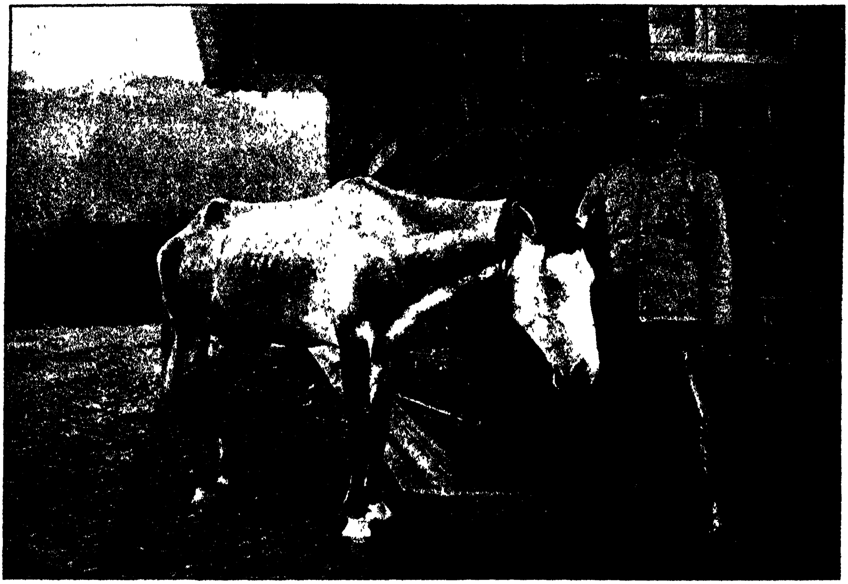
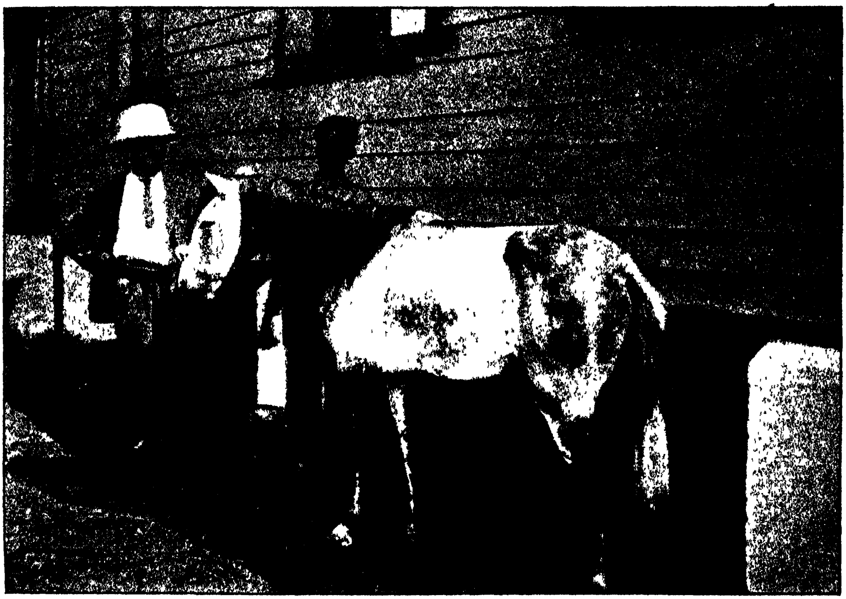
[1] Being a continuation of the Report in the July number of the Journal.



*Copyright.*] [Photo. by Mr. Lisk Carew, Sierra Leone.

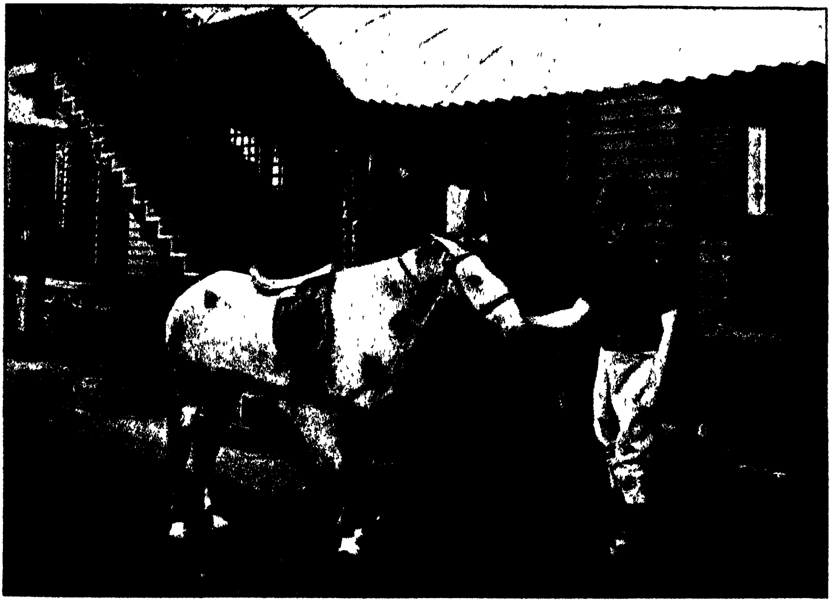
FIG. 1.—Experiment No. 21. Photograph of horse "Sewi" taken on the twenty-third day after inoculation.



*Copyright*] [Photo. by Mr. Lisk Carew, Sierra Leone.

FIG. 2.—Convalescent. The horse "Sewi" on sixty-fourth day.

the animal first arrived it was in poor condition, but quite up to the average of other animals in the country. This horse, which is now on its way to England, where it can no longer be exposed to re-infection, naturally will be kept under observation for a further extended period, to prove whether a permanent cure has really been obtained. As is well known, in dealing with the question of "cures" with regard to trypanosome diseases, many fallacies are apt to arise, and the question of *time* is an important one. With regard to the trypanosome in question, it has already been suggested that this is one and the same as that which obtains over a very extended area of West Africa, the Sudan, and part of East Africa. The latter has already been named *Trypanosoma dimorphon*, owing, no doubt, to the dimorphism which the original observers said was characteristic. But the feature of dimorphism is conspicuous by its absence in the Sierra Leone strain, and in that of others which I have had an opportunity of examining.



*Copyright.*] [Photo. by Mr. Lisk Carew, Sierra Leone.

FIG. 8.—Experiment No. 21. The horse "Sewi" taken on the 182nd day after inoculation.

The Sierra Leone strain appears to be an essentially short trypanosome, with much less variation in length, &c., than is found in other well-known pathogenic trypanosomes, such as *T. gambiense*, *T. brucei*, &c. It is most constant within its somewhat narrow limits of variation, viz., between 12 to 14 $\mu$ (16 $\mu$ being exceptional, and the few slightly longer forms that were found showing signs of division having commenced were therefore excluded).

We have reason to believe that the same holds good for the other strains of the African trypanosome. It has been suggested to me that the original question may have been involved by the presence of a "mixed strain." This would certainly serve as an explanation of the present anomaly.

The whole question is also involved by a multiplicity of names, such as *T. congolense*, *T. sudanense*, *T. nanum*, &c., which only serve to complicate matters still further. If these forms, including *T. dimorphon*, be one and the same trypanosome, then a single name should suffice. Such a name as *T. brucei* (*brevis*) would certainly simplify matters, and would on clinical grounds be by no means inappropriate.

A further point of economic importance would be to ascertain whether the "combined method" of treatment would prove to be equally valuable wherever this trypanosome exists; for our experience of the naturally acquired disease in cattle[1] and that of our laboratory inoculations has been that it is invariably fatal. The same thing applies to horses and dogs, of which in the case of the former there are probably no more than twenty or so now living in the Colony.

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[1] "The Investigation of Cattle Disease in the Protectorate of Sierra Leone," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, January, 1908.

# United Services Medical Society.

## SYPHILIS IN THE UGANDA PROTECTORATE.

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Of England's more recent Colonial acquisitions, none is better known to the medical profession than the Protectorate of Uganda, made familiar to it as having been the locality almost devastated by sleeping sickness. Unfortunate as this outbreak would have been at any time, it was doubly so at the precise period when it made its appearance. Before its advent, another malady of even a more serious nature had begun to sap the life-blood of the tribes. Syphilis was very prevalent in the Protectorate, and the researches connected with sleeping sickness overshadowed all attention to the syphilitic outbreaks, attracted every interest and set back all investigations into the subject of syphilis in that part of the world. The consequence was that syphilitic disease was allowed to gain a footing in the Protectorate, and, being left to itself, caused devastation everywhere among the inhabitants. Syphilis assumed such a serious aspect that His Excellency the Governor, Mr. Hesketh Bell, C.M.G., applied to the Secretary of State for the Colonies for an inquiry to be made into the subject of syphilitic diseases in Uganda by an expert from this country, who should consult with the medical staff of the Protectorate and discuss the means which should be adopted to check the ravages of the disease. I was selected and proceeded to the Colony. Before detailing my experiences, a brief historical *résumé* of the country may be of interest.

In the first place I may say that there seems to be a certain amount of haziness as to the relations these two Protectorates, British East Africa and Uganda, bear to each other, both geographically and otherwise. The British East Africa Protectorate comprises the territories bounded on the south by German East Africa, on the east by the Indian Ocean, on the north by Italian Somaliland and Abyssinia, and on the west by Uganda.

Mombassa is the seaport town of East Africa. The Uganda Railway has opened up vast territories in the interior which are eminently fitted for European colonization. The climate, except on the coast, is very good—in fact, ideal in some places, such as Nairobi, Narvesha and Mau Escarpment.

Altitudes varying from 4,000 to 8,000 feet may be attained. The total area is about 120,000 square miles. The population is about 4,000,000, viz., 300 Europeans, 3,000 Asiatics, and 3,500,000 natives. The Uganda Protectorate is bounded on the east by British East Africa, as far north as the 6° N. latitude, on the south by the Anglo-German boundary and 1° S. latitude, on the west by the Congo Free State, and on the North by a line between Ladi and the White Nile.

Uganda is reached from Mombassa by the Uganda Railway, opened in 1901. This railway extends from Mombassa on the coast to Port Florence on Lake Victoria Nyanza, and is 584 miles long; in its course it passes through a varied description of country, from the arid land of the inhospitable Taru desert to the fertile highlands of Narvesha. It ascends and descends to various altitudes, reaching its maximum of 8,500 feet at the Mau ridge.

Among the sights seen on this railway journey none is more wonderful than the amount of large game; every description of game in hundreds can be seen from the railway carriage window.

Port Florence is situated at the south-east end of Lake Victoria (which latter is 320 miles long by 220 miles broad). This magnificent sheet of water is crossed in about twenty-four hours, when Entebbe, which is the official capital of the Uganda Protectorate, is reached, and here we are in Uganda.

## HISTORICAL RÉSUMÉ.

The Kingdom of Uganda, which forms the nucleus of the Uganda Protectorate, was first brought to the notice of the world outside Africa in the year 1862 by an expedition under the command of the celebrated explorers Speke and Grant, who were at the time endeavouring to discover the source of the Nile. Previously, rumours of the existence of a powerful and semi-civilised African kingdom on the northern and western shores of the Victoria Nyanza had been brought to Zanzibar by Arab traders, but the country was not even heard of by the Arabs of Zanzibar before 1852. Yet Uganda is an ancient kingdom of considerable stability, which has been ruled for several hundred years by a single dynasty, having its reputed origin in a mixture of myth and tradition, and in all probability due to a conqueror of the north of that Hamitic race—the Bahima—which still forms the aristocracy of the western parts of the Protectorate. The Bahima were certainly of Hamitic stock, and closely related in origin to the Somali, and less closely, yet obviously so, to the Ancient Egyptian type. The Bahima at one time exercised widespread influence over the inner regions of East Central Africa. In Uganda proper, though the Hamitic invaders probably founded the dynasty, they did not remain to form the aristocracy as they had done in Unyoro, Toro, and the countries to the west of Uganda. They encountered in Uganda proper a very vigorous race of mixed negro type, sufficiently sturdy to hold its own, but equally prone towards civilisation to adopt the culture of the Hamites. This is the Baganda people. Great power radiated from this Kingdom of Uganda; the regular and abundant rainfall, the fertile soil, wealth of food and easily collected banana plantations caused this country to become the seat of a relatively dense and powerful population, which imposed its rule over a large portion of the present area of the Uganda Protectorate. Interest in the country was further excited by the visits of Sir H.M. Stanley in 1872. King Mutesa, the reigning monarch, had become interested in European civilisation since he had met Speke and Grant, and was in search of a religion superior to the worship of the earth, water, and ancestral spirits, and he was not satisfied with the tenets of Islam which had begun to attract a portion of his people. Stanley addressed a memorable appeal to the missionaries of England to introduce Christianity at the Court of Mutesa. The answer was immediate, and in 1876 the first British missionaries were on their way to Uganda. These were followed two or three years later by the emissaries of Cardinal Lavigerie, *i.e.*, members of the mission of the White Fathers. In 1884 King Mutesa died, and after his death Christianity in its Roman and Anglican forms and Mahomedanism made such rapid strides that soon only a few pagans were left in the Kingdom of Uganda. In 1894 a British Protectorate over the Kingdom of Uganda was declared, and this was further extended in the course of a few years until it gradually came to comprise the five provinces now included within its limits, *i.e.*, Central, Nile, Uganda, Western and Rudolph. The total area of the Protectorate is 130,000 square miles. The population is 3,000,000. The population of the Kingdom of Uganda is about 1,000,000, and 100,000 of them are Christians.

For the purpose of administration, the natives, especially those speaking Banta, are encouraged to govern themselves. For instance, the Kingdom of Uganda (16,000 square miles) is divided into twenty districts, each of which is placed under a chief appointed by the King of Uganda, subject, of course, to confirmation by the Imperial Government. These twenty chiefs are under the control of the King, who is assisted in his government by a Lukiko, a native parliament, elected on lines laid down by the British Government. Similar arrangements exist in the other provinces. Throughout, the King, or his chief, as the case may be, is encouraged to govern his people on humane principles, with only that amount of interference from the nearest European official as may protect the native from injustice.

*Climate.*—With perhaps the exception of the Nile and Rudolph Provinces, the climate of the Uganda Protectorate is not unhealthy, and large portions of it being 4,000 feet above the sea level, the heat is not excessive, even under the Equator, and it is very rarely disagreeably hot at any time of the year. Average maximum temperature 83° F., average minimum temperature 55° F. Parts of it, such as Toro and Ankole, have a climate resembling the month of June in England. I should say that the Protectorate has, as a whole, a healthy climate, although many parts of it are insalubrious, owing to the presence of mosquitoes and malaria.

*Products.*—It would be out of place to discuss, in any detail, the many products which this wonderfully fertile country is capable of bringing forth ; suffice it to say that it needs no expert to see at a glance that almost anything in the way of vegetation flourishes. About one-fifth of the total area of the Protectorate is covered with rubber-producing trees and vines, gutta-percha is now extensively cultivated, cotton—introduced only a few years ago—is growing in the most wonderful way, as also is sugar, coffee and cocoa, in fact, the casual observer cannot help recognising what a jewel England possesses in holding this land, and what a splendid future is in front of it if we can but save the native from extermination by disease.

*Inhabitants.*—The Baganda is the predominating tribe. They are a race of mixed negro type, sturdy in physique, extraordinarily intelligent, willing, hard working, and on the whole honest. They are brave and fought well in their own wars, and for us ; but what struck me more than anything was their intelligence ; personally, I never expected the negro to attain to the level that they have in this respect. Their eagerness to learn is also a marked feature.[1] I cannot help here quoting the words of Sir Harry Johnston with reference to the Baganda : "In my opinion there is no race like them among the negro tribes of Africa. They are the Japanese of the dark continent, the most naturally civilized, charming, kind, tactful, and courteous of black people."

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[1] On his return from Uganda in 1892, my old friend Sir F. Lugard spoke to me in the highest terms of these same Baganda people, but unless I had experienced it I could never have believed the negro capable of attaining such a high level of intelligence.

*Diseases.*—(*a*) Malaria is prevalent along the coast at certain times in the year, especially during the wet season; (*b*) blackwater fever is, on the whole, rare; (*c*) spirillum fever has of late years made its appearance. It was apparently unknown until the introduction of the tick from the West Indies. It is conveyed by that insect. Of late years it has unfortunately become very prevalent, and is proving a real curse to Europeans especially. It has also in many cases assumed a very virulent type, sometimes leaving blindness and local paralysis as a sequel. This spirillum fever is causing anxiety among the authorities, as they fear its extension. But the two diseases which at present threaten to exterminate the whole population are: (*a*) sleeping sickness; and (*b*) syphilis. As regards the former, all that need be said here is that barely seven years ago it made its way from the Congo basin to Uganda, and in that time it is estimated that 300,000 of the inhabitants have perished from it.

## THE CONSIDERATION OF SYPHILIS IN THE PROTECTORATE.

As regards the latter, if the opening of Africa from the west has been responsible for the introduction of sleeping sickness, the opening up from the east has introduced, if possible, a more appalling visitation in the shape of syphilis. In saying this I do not intend to maintain that the disease was unknown in the land prior to its invasion from the east, for there is evidence of its having been present there for many years, and it is supposed to have been originally introduced during the Arab invasion some sixty years before, but that it existed only to a very small extent is also certain. About twelve years ago there was a more or less sudden outbreak of the disease among the Baganda tribe, since which time it has gone on increasing both numerically and in virulence, until at the present time more than half the population of the Protectorate is infected. In some districts, such as Ankole, it is estimated that 90 per cent. suffer from it. Infant mortality is as high as 50 to 60 per cent. owing to it, and it is the chief cause of the sterility which exists throughout the country. In fact, as things stand at present, through syphilis, the entire population stands a good chance of being entirely exterminated in a very few years, or left a degenerate race fit for nothing. In connection with this sudden outbreak, the question arises as to what was its cause or causes, and investigation has convinced me that the causation has a two-fold origin, viz., (1) The introduction of Christianity; (2) the abolition of the punishments formerly meted out among the tribe for all immoral offences committed by either sex. With regard to the first cause, repugnant as it may seem to assert it, I fear it is none the less true that the introduction of Christianity, and the consequent abandonment of polygamy and old restrictions on the liberty of the women, was probably the chief cause of the outbreak. This conclusion is based on the evidence, not only of members of the Church Missionary Society and the White Fathers, but also on that of some of the most intelligent of the native chiefs, who themselves hold the Christian beliefs. The following are extracts taken from the summary of evidence of some of the principal witnesses: The Rev. J. Roscoe, C.M.S., Chief of the Theological College at Kampala, who has spent twenty-five years of his life in Uganda, states: "The cause of the outbreak was in my opinion the following: Among the Baganda, up to about twelve years ago, a custom prevailed of keeping the women belonging to it under strict confinement and surveillance; in fact, so strictly was this adhered to that they were more like prisoners than anything else, hence immorality and promiscuous intercourse did not exist. Corresponding with the time of the outbreak of syphilis, the chiefs of the Baganda tribe, the majority of whom had become Christians, decided to remove these restrictions, as being contrary to Christian teaching, and to set the women free. This was done, and from that time the women were released, henceforth to roam where and whither they willed and do as they liked. Other Christian tribes followed the example of the Baganda, and even those who had not embraced Christianity followed their example, as they usually do in almost all affairs of life, the Baganda being the predominant tribe. The result of the removal of those restrictions was exactly as one would have expected, *i.e.*, promiscuous sexual intercourse and immorality. I consider the above to have been the main cause of the outbreak of syphilis among the tribes of the Protectorate." The very Rev. Père Laane, Father Superior of the White Fathers, Entebbe, says: "As to the cause which has led up to this outbreak, I believe it to have been the emancipation of the Baganda women from the restrictions in which they were formerly held." Sir Apolo Kagwa, K.C.M.G., the very enlightened native Prime Minister, remarks: "The probable immediate cause of the outbreak was the emancipation of the Baganda women from the surveillance to which they had hitherto been subjected." The evidence of many others, as given in the summary of evidence, is strong proof that the abolition of polygamy had at least a very great deal to do with the outbreak of the disease.

As to the second cause, doubtless the custom which had previously existed among the tribes of administering punishment for immoral offences had a deterring effect, and in this way acted as a safeguard. The abolition of these punishments encouraged the commission of these crimes, and lent itself to the propagation of the disease among the people.

*Spread : the Main Cause.*—With regard to the spread of the disease, with its consequent intensification, there can be little doubt as to what was the main cause. The country has been opened up from the East. This allowed of free ingress of the Indian-Swahili traders from the coast, who not only acted as mediums for the spread of syphilis in their wanderings throughout the country, but also introduced into the Protectorate much fresh disease. The evidence on this point is unanimous.

Other causes are alluded to as aiding the spread of syphilis. The first is, in my opinion at least, a "doubtful" one. It is said that the Bahima were, to a great extent, responsible for its dissemination. This tribe, otherwise known as the "Cow" tribe, are shepherds, and live a wandering or bedouin life. The Rev. J. Roscoe, C.M.S., who has made a special study of this people, says in his evidence : "There is another medium through which I think syphilis has widely spread, viz., the presence in Uganda of a certain number of the Bahima tribe (the Cow people of Ankole), a migratory tribe, amongst whom some curious customs exist. Thus, after a woman is married, all sexual restrictions are thrown to the winds. She may welcome to her bed any of her husband's friends or relatives with impunity. When a friend visits a man, he sleeps in the same bed with him and his wife, and the rules of hospitality are such that the host must leave his wife to his friend in the early morning. When a man is absent from home, and a visitor arrives, the wife must entertain him, and, if he should so desire it, act as his wife. It may well be imagined, then, what a fruitful source for the dissemination of syphilis and other venereal diseases the Bahima are." Lieutenant-Colonel Will, R.A.M.C., remarks: "In the province of Uganda, the Bahima (Cow tribe), who are migratory, are responsible in a great measure for spreading the disease."

In the course of my investigation I discovered the existence of a third and much more real cause for the spread of syphilis. I had heard rumours of a practice which was said to exist in some of the provinces of deliberate vaccination of healthy infants with the syphilitic virus from affected persons, the *rationale* being that syphilis communicated in this way during infant life conferred immunity from it to the adult. As stated, investigation proved that this dreadful state of things does exist, and to a very great extent in some of the Provinces. The following are extracts from the summary of evidence of some of the witnesses as regards this: The Rev. Père Laane, Father Superior of the White Fathers, says: "Undoubtedly a practice exists in some parts of the country of deliberately inoculating infants with syphilitic virus to prevent a repetition of the disease in grown-up life. This is especially the case in and about Hoima, in the Province of Unyoro. The people there have told us over and over again about this. The practice is to wrap the infant, when only a few days old, in clothes which have been smeared in syphilitic discharges. Of the existence of this practice I have no doubt whatever, and have had to make it the subject of my sermon on more than one occasion." Sir Apolo Kagwa says: "Yes, it is well known that in certain Sasas this practice does exist, in Buyagu, Bugangadai, and Hoima. The people vaccinate infants with the virus of syphilis with a view to preventing them getting the disease in adult life. The consequence is that in these countries probably 90 per cent. of the population is affected." The Rev. Father Moullin, of the White Fathers, says: "I am in a position to say that this practice does exist to this day among the Bunyoro—not so with the Baganda." Chief Mugwanya, Second Regent, remarks: "Deliberate vaccination with syphilitic virus is common in some of the Sasas, especially Buyagu." Dr. Goodliffe, Colonial Surgeon, says: "I have heard it stated, and, although I have no direct evidence of it, I have reason to believe it is true, that in some parts of Unyoro Province a practice exists of deliberately inoculating infants with the syphilitic virus, to protect them from again contracting the disease."

## INCIDENCE OF THE DISEASE.

Unfortunately the statistics are of such a meagre description that no accurate conclusion can be arrived at as regards the actual incidence of syphilis in the Protectorate as a whole.

*Syphilis as it Exists.*—Syphilis, as seen to-day in Uganda, presents the usual picture of what it has always done when the disease is implanted on virgin soil and allowed to run riot without treatment. It is the same picture which was depicted by William Ferguson (afterwards Sir William Ferguson) of what he saw under similar circumstances in 1813, whilst in Portugal, viz., mutilation everywhere. He said then of Lisbon that more cases of mutilation from syphilis could be seen in that city in one day than would be observed anywhere else in a year, and I imagine the same can be said of almost any station in the Uganda Protectorate to-day. Under the circumstances, the disease has assumed its well-known characteristic virulence. In the primary form, the true Hunterian chancre is the rule, and this as often as not takes on a phagedenic character, resulting in wide destruction of the surrounding soft parts. The second stage of the disease is characterised by intense and confluent eruptions, ulcerations of the mucous membranes, laryngitis, iritis, periostitis, and joint affections, profound anæmia, cachexia, and general disturbances of the nutrition. In some cases, the principal secondary manifestations are of a nervous kind, as exemplified by neuralgic pains, asthenia, paralysis and analgesia. The tertiary stage is represented by early rupial syphilides, which extend rapidly and deeply over the body and limbs; osteo-arthritic manifestations, with severe nocturnal pains, periostitis, necrosis of femur, tibia, clavicle, and bones of forearms; the joints become distended with fluid and sometimes become ankylosed. Gummatous ulceration destroys the eyelids, nose, and ears, bringing about varieties of mutilation which it is one's lot to see in Uganda day by day.

Saddest of all is the number of cases of hereditary syphilis. One is constantly coming across, in every part of the country, boys and girls between 8 and 10 years of age affected in one way or another, one of the commonest affections being osteo-arthritis of both knees. Caries of the bones of the face and base of skull are common, whilst it need not be said that blindness due to interstitial keratitis is a common occurrence. With regard to the effect syphilis has on the child-birth and infant mortality, Dr. A. C. Cook, C.M.S., makes the following statement: "From statistics based on obstetrical (confinement) out-patients, I calculate that 75 per cent. of the pregnancies among the Uganda women ended either in abortion or miscarriage, premature labour, or still-births, or the infants die within the first week of life. This latter is mainly due to syphilis, which in this connection the Baganda called "Munyo."

Parasyphilitic affections are not very commonly seen. In fact, they are rare, the reason probably being that the disease has not existed, at least to any extent, in the country for a long enough time. Further, we would hardly expect to find syphilitic nervous affections existing to any extent among the class of patients under consideration. A certain number of cases showing early tabetic symptoms came under my notice, and quite a number of young able-bodied men, with syphilitic histories, who suffered from complete loss of sexual power.

### *Proposed Method for Checking the Disease.*

*Preventive Measures.*—One's first idea was that the most effectual method of combating such a widespread syphilitic outbreak would be compulsory legislation. A Contagious Diseases Act, for instance. Under the circumstances, this measure could not be entertained, owing to the strong concensus of opinion—medical, clerical and lay—which was opposed to it. Doctors and laymen object to a Contagious Diseases Act on the ground that the state of civilisation in the Protectorate did not lend itself to any such measure. The Anglican Church Mission strongly urged objections of a moral character. The only body with whom the suggestion found favour was the White Fathers, and they were unanimous for its adoption. I was consequently obliged to look in other directions for means of dealing with the prevention of the dissemination of syphilis, and fortunately one method gave great prospects of success. I have already pointed out that, for the purposes of government, the various provinces are divided into districts, each of the latter being under a chief, appointed by the King and Government. The influence this chief exercises over the people in his district is very great. He can do almost what he chooses with them. It struck me that, by enlisting the sympathy of these powerful chiefs for the stricken people under their charge, great assistance could thereby be obtained, and I formulated in my mind a scheme for gaining their co-operation and powerful aid in this matter. This enabled me to trust to prolonged treatment, both for the prevention and cure of the disease. The chiefs could influence the people to report their sickness and attend at suitable places for regular treatment. This I thought preferable to any legislative measures. This object being in view, I proposed to limit the experiment in the first instance as a tentative measure to the Kingdom of Uganda. I suggested that throughout the districts of this part of the country small rooms, which I term "Treatment

Rooms," should be established and be situated within reasonable access of all patients. Each of the "Rooms" would be placed under the charge of a medical subordinate, and visited once a week by a medical officer for the purpose of carrying out continuous treatment. Syphilitic patients would attend once a week for treatment and observation. Reliance in this way would be placed on the influence and sympathy of the chiefs for ensuring regular attendance of the afflicted. In each "Room" a register would be kept in which the names of all syphilitic patients would be entered and forwarded to the respective chiefs, who would enter them on registers which they would also keep. A card should be given to each patient, on one side of which important details as to the nature of the disease from which the patient is suffering, its dangers to himself and others, with the necessary precautions which he ought to take, would be printed. On the other side, instructions as to the day for attendance for treatment would be set out. Should a patient fail to attend on more than one or two occasions, without sufficient excuse, the fact would be notified to his respective chief. By means of this "continuous treatment," the patient would have a chance of being cured of his disease, and in any case he and his offspring would be safeguarded against its future ravages, and, whilst undergoing the treatment, he would be rendered harmless to others.

Everything in this method of dealing with the Uganda outbreak depends on the sympathy of the chiefs. In view of this, I had private interviews with a great many of them, including the Prime Minister and the two other Regents, and soon discovered that all of them not only took the greatest interest in the subject, but were most willing to assist. They took a most comprehensive view of the syphilis question, and quite appreciated the necessity of long-continued treatment. The official summary shows how greatly the chiefs appreciated this scheme which I proposed, and how they concluded it could be easily carried out. On January 6th, 1908, I gave an address before the young King of Uganda and his assembled Parliament, the object being to explain to them the nature of the disease we had to deal with, the ravages it had committed and was still doing, and to lay before them the scheme which I proposed to adopt to check its further progress. The address was listened to with the greatest interest and attention, but nothing surprised me more than the speeches which followed, and which were delivered by some of the chiefs, showing as they did the most complete and intelligent grasp of the subject under discussion as well as a thorough knowledge of the ravages which syphilis had already perpetrated among the tribes, and which, if left unchecked, would ultimately end in practically complete racial extermination. Listening to these speeches, one could hardly believe that one was hearing them from the lips of the black men in the centre of Africa. In the end, I found I had the entire intelligent sympathy of the assembly of chiefs, as they were prepared at once to do their share in carrying out the proposals of my scheme. I may add that the whole population showed interest in the subject. Previously, losses from syphilis had come to be regarded as Kismet. The fresh proposal gave them fresh hope, at which these poor people eagerly grasped. This meeting under the King of Uganda in Lukiko will, I feel sure, turn out to be as important an event as it will be memorable to me.

In addition to the "Treatment Rooms," I proposed that in each Province a large hospital for the treatment of venereal diseases should be established for the treatment of hospital cases, each to be placed under the charge of medical men specially qualified in venereal diseases.

As regards the question of any special line of treatment which should be followed, that, of course, would be optional for medical officers to select as they thought best; but for continuous treatment I believe it will be found that the only feasible method to carry out effectually in the circumstances under consideration is the "intramuscular injection" treatment.

Here I may mention an interesting fact. When I arrived in Uganda I found that both there and in other parts of East Africa, the medical men were prejudiced against administering mercury in any shape or form to the natives. They assured me that the natives were most peculiarly susceptible to its action, and became salivated after minute doses. Dr. A. C. Cook, C.M.S., whose experience among the natives is, to say the least, unique, told me that such was his experience and he had been giving mercury of late years only when forced to do so, and even then only in the smallest doses. In spite of all precautions, salivation occurred, and he warned me to be on my guard with mercury as regards the African natives. However, I felt confident from old experience that given intramuscularly the drug would be far better borne than when given by the mouth. At a demonstration at the Church Missionary Hospital I gave a number of native patients injections of half my usual dose, viz., grain ½ (metallic mercury), and not one was followed by any untoward effect, and the following week I gave a number of full dose injections, with similar results.

Since then Dr. Cook and many other district surgeons have continued the injections for both syphilis and sleeping sickness, and have had no bad effects.

The conclusions arrived at may be set forth as follows:—

(1) That up to within recent years syphilis existed in Uganda only to a very limited extent, and was of the mildest type.

(2) About twelve years ago there was a more or less sudden outbreak of the disease.

(3) That the causes of this outbreak were probably: (*a*) The emancipation of the Baganda women. (*b*) The abolishment of punishments hitherto meted out for immoral crimes.

(4) That it was spread through: (*a*) The opening up of the country generally, allowing of free ingress and egress. (*b*) The doing away of the custom of isolation as regards syphilitics, which had hitherto been in vogue among the tribes.

(5) That syphilis was spread mostly by Swahili and East Indian native traders from the coast, and to a lesser extent by members of the Bahima tribe.

(6) That the disease has spread and continues to do so throughout the land.

(7) That its incidence varies in different places, being placed as high as 90 per cent. in certain districts, the inhabitants of which it threatens to decimate.

(8) That syphilis is the chief cause of the high infant mortality, as is seen from the rough figures showing the deaths from "Munyo," by which name the native knows infantile syphilis.

(9) There is every reason to think that syphilis is the chief cause of miscarriage and abortion among the native women.

(10) There is at least strong presumptive evidence that a practice exists in some of the districts of deliberate syphilitic vaccination.

(11) With regard to prevention and treatment it was recommended: (*a*) That the present state of civilisation in the country does not permit of any legislative preventive measures. (*b*) That for the present reliance must be placed more on the better and more thorough treatment of the disease.

(12) For this purpose it is recommended that: (*a*) "Treatment Rooms" should be established, and be so situated as regards distance as to be within reasonable reach of all patients. Then syphilitic patients could attend once a fortnight for treatment. (*b*) Each Treatment Room should have a resident medical subordinate (Indian native) in charge, and should be visited regularly once a week by a medical officer. (*c*) That in each room a syphilitic register should be kept, in which would be entered the names

of all syphilitic patients. (*d*) That a similar register should be kept by each chief. (*e*) On a patient reporting sick and his case being diagnosed syphilis, his name should be entered in the "Room" Register, and also sent to his respective chief for entry in the chief's register.

(13) Non-regular attendance on the part of a patient should be reported to his respective chief.

(14) Much reliance would be placed on the influence of the chiefs to insure regular attendance.

(15) That a special venereal hospital be established in each province for the reception of hospital venereal cases. That such a hospital be placed in the charge of a medical man with special knowledge of venereal diseases. It would also serve as a venereal clinique for the medical staff of the Protectorate, a thing to be very greatly desired.

Of our chances of being able to grapple successfully with syphilis in Uganda I am very hopeful, as I consider the general conditions are favourable. In the first place we have a naturally healthy and sturdy race to deal with, who are intelligent enough to recognise the dangers of the disease, and the ravages it has already committed among them and their children, who are desirous of being rid of the disease, and willing to undergo any treatment with that object.

For the successful treatment of syphilis, experience has taught us that complete control of out-patients, so as to insure regular attendance, with consequent regular treatment, is an absolute essential. In the Army in India, through having this control of our patients, and by means of the intramuscular method, the invaliding rate for syphilis has been reduced some 70 per cent.

Now in the Uganda Protectorate I believe we can count on even a more complete control of our patients than in India, for the influence of the chief over the people is remarkable, and his word is law; hence, with his sympathy on our side, complete and regular attendance can be relied upon, so that there is every reason to think, without being too optimistic, that our chances of being able to deal successfully with syphilis in Uganda are at least as good as they were ten years ago in India, and if we can bring about anything like the brilliant results achieved in that country we shall have cause for congratulation.

## DISCUSSION.

Captain Dorgan related his experience in a large station in India, and considered that an average of 2 grammes might be given. In a large series of injections he never found any harm result. Several relapses might occur even with large doses if treatment was discontinued. In injecting it was difficult to give sufficient without giving too much. He thought that a great deal of reduction of syphilis in India was due to prevention of infection.

Major French said he had used the mouth, inunction, and injection methods of treating syphilis extensively during a period of fifteen years in large military hospitals. In early syphilis—*i.e.*, during the chancre and early rash stage, and before the disease had become established—he was convinced that the inunction method of administering mercury was infinitely preferable to the injection of insoluble salts such as grey oil. He had conducted a close research on this point during the past nine months, and found that when inunctions of ung. hydrarg. were judiciously used, the induration of the chancre and of the lymphatic glands was much more rapidly and thoroughly dissipated, and that a gain of several pounds in weight was the rule and not the exception. He found severe relapses and loss of weight to be much more common after the use of insoluble grey oil, and the lymphatic glands were not nearly so beneficially affected.

We were chiefly concerned in the Army with arresting syphilis of hospital patients in the chancre and rash stage. At Woolwich, in the year 1903, the intramuscular injection of grey oil was used for in-patients. There were 477 admissions for syphilis. In 1904 there were 331 admissions, regular out-patient attendances commencing in that year. In October, 1905, he initiated inunctions for in-patients, grey oil injections being reserved for out-patients. In 1906 there were only 129 admissions for syphilis, and in 1907, 87 admissions. In October, 1905, there were some 150 men attending as out-patients for syphilis. Average number of out-patients now was 61. The method of inunction prevailing at Woolwich was on the general lines of Aix-la Chapelle, modified by Service conditions. Hot baths were essential before rubbing. The groins and arm-pits were closely shaved to prevent pustulation—these places were selected owing to the greater frequency of glandular orifices, which regulated absorption. The abdomen and back were also rubbed. The dose was ʒi. ung. hydrarg. B.P., compounded with lanoline or other substances. Forty inunctions formed the first course; this was most important. He usually gave twenty-five and stopped for a week, and gave potassium iodide during the week's interval, then fifteen more.

In the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS for May, 1908, Colonel Lambkin's article attributed the brilliant results obtained in the British Army in recent years to the injection of insoluble grey oil (Lambkin cream).

Inspector General Bentham, Dr. Power and Surgeon-General Sloggett also took part in the discussion, and Colonel Lambkin replied, and a hearty vote of thanks was accorded to him on the motion of the President.

# Lecture.

## SOME IMPERIAL ASPECTS OF THE STUDY OF TROPICAL MEDICINE.[1]

By Sir CHARLES BRUCE, G.C.M.G., K.C.M.G.

The history of St. Thomas's Hospital is the history of the nation from a single point of view. It displays a long procession of social forces that have made the health of the people the first concern of local and imperial government. In the administrative staff of 1557 the surgeon ranked after the shoemaker, and it was not till ten years later that the staff included a physician. The present Hospital—on a noble site, appropriately fronting the Houses of Parliament and the area occupied by the great Departments of State—constructed, equipped and organised in accordance with modern ideas, is a symbol of the place assigned to the medical profession in the modern administrative system of the Empire. For to the medical profession—including in the term the exponents of sanitary science—is assigned the imperial duty of preserving the health of an infinite diversity of races in an infinite variety of environment. And the Medical School of the Hospital is a guarantee of the purpose of the Governors to qualify the profession for the burden and dignity of its high trust and function. The work of the School is therefore distinctly a matter of imperial concern, and I rejoice, as I am sure we must all rejoice, to learn from the report of the Treasurer that it maintains the high standard of efficiency that has distinguished it in the past.

In the wide range of study and research exhibited in the prospectus of the School, I am naturally attracted to an area of work of which I can speak with the sympathy of nearly forty years experience. I propose, therefore, to say a few words on some imperial aspects of the study of tropical medicine. If my experience has enabled me to appreciate the value of the work already accomplished it has given me opportunity to estimate the magnitude of the area as yet hardly touched. The self-governing Colonies, with interests lying mainly in temperate zones, have of late years attracted so much attention that an enormous expansion of the King's over-sea dominions in the Tropics has been going on with comparatively little observation. They now cover an area of about four million square miles, a fourth of the entire area of the Empire; while their estimated population is nearly a fifth of the estimated population of the world. But the conditions of tropical life and environment are not limited even to this wide range. They extend to the whole heat-belt lying within the northern and southern isotherms of 68° (F.) mean annual temperature, or about 30° north and south of the Equator. So that the sphere of influence of tropical medicine may be said to occupy all this vast area.

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[1] An address delivered on the occasion of the distribution of prizes at St. Thomas's Hospital Medical School, in June, 1908.

The relations of Europe with the Tropics have passed through three stages—a period of plunder, a period of trade, and a period of occupation. And the period of occupation has revealed quite unexpected sources of wealth. There was a good deal of romance in the influences that inspired the adventurers of the earlier periods, but there is nothing of romance in the solid substances that have of late excited the cupidity of nations and engaged all the Great Powers in conflict for a share of the tropical regions of the earth. Among the products of agriculture and forestry, apart from articles that enter into the daily use of every household, such as sugar, tea, rice, tobacco, I need only remind you of two raw materials, cotton and rubber. It is probable that nearly one-half of the population of the United Kingdom derive their living, more or less directly, from industries dependent on an adequate supply of these materials; and it is impossible to over-estimate the importance of a supply sufficiently regular and stable to free us from the risks of shortage and foreign speculative manœuvres. The mineral resources of the Tropics we have hardly begun to explore, but we know that in addition to gold and gems they include substances of universal present demand, such as mineral oils, and of infinite promise for the future, such as thorianite and other possible sources of radium.

But if the experience of occupation has enabled us to realise the economic uses of the Tropics, it has compelled us to realise the extent to which the agencies of beneficial occupation—industry, commerce, military and naval defence and good government—are dependent on the preservation of health against tropical diseases.

I need hardly remind you that in the Tropics all industrial enterprises depend upon an adequate and regular supply of manual labour. Regulating this supply we have to consider three material facts. Firstly, the most profitable lands—for instance, the lands most appropriate to cotton cultivation—are largely found in malarial areas with no efficient labour supply. Secondly, and consequently, with the exception of India, where there is a pressure of population, we have no tropical possessions of any commercial importance in which the elementary operations of industry are not carried out by imported labour. And thirdly, experience has proved that the migration of large bodies of men from tropical areas of economic pressure, or from conditions to which they have become adapted, is always attended with the danger of spreading disease.

In these circumstances the constantly increasing demand for labour to exploit new areas brings home to us the constant wastage from disease. Within limited areas of British India, during the first seven years of the century, nearly 6,000,000 persons, mostly in youth or in the prime of life, have perished from plague alone. In 1907 the average mortality exceeded 25,000 weekly. In Hong Kong and Mauritius during the same period the mortality from plague has been hardly less serious in proportion to area and population. Some years ago plague appeared for the first time in South Africa; it recently visited West Africa; within the last few weeks it has been reported in Trinidad and South America. If in Africa and America its progress has been promptly arrested, it is to tropical diseases research that we owe this triumph of science. Of the contemporary wastage of labour from malaria, yellow fever, cholera and other tropical diseases I can give no estimate. But the stations I have mentioned on the itinerary of plague illustrate the distribution of tropical diseases from centres of origin following the migration of labour. A few years ago an outbreak of beri-beri among the Chinese introduced into South Africa first directed public attention in England to that terrible disease. Meanwhile the expansion of English interests in Equatorial Africa has been accompanied by the introduction of sleeping sickness into Uganda. Colonel David Bruce, R.A.M.C., in a paper recently read before the South African Society, traced the spread of the disease following the increased demand for labour, and insisted on the duty of England to arrest its further progress by preventive measures, and not rest until it is stamped out.

Many years ago Livingstone declared the tsetse-fly to be the greatest obstacle to civilisation in Africa. The researches of Colonel Bruce and others have thrown the light of science on the processes by which it works. The infection of sleeping-sickness is caused by a parasite called a trypanosome transmitted by a tsetse-fly, which is thus the carrying agent of the deadliest of all known diseases of humanity; while varieties of the same parasite and the same fly are the infecting agents of hardly less deadly diseases among animals. In this way the tsetse-fly is the carrying agent of diseases equally fatal to industry and to commerce; commerce implying the transport of commodities from the place of profitable markets by land and sea.

Among the basal facts of economic geography we have to recognise the extent to which all methods of land conveyance—human labour, animal draught and mechanical transport—are affected by tropical diseases. The abolition of slavery and the substitution of animal draught for carriage by native bearers has involved the movements of animals on a large scale, with exactly the same results that have followed the migration of large masses of men. They have become agents of infection. Some years ago the fly-borne disease known as surra was introduced into Mauritius and gave me practical experience of the extent to which an animal disease is capable of paralysing every operation of private enterprise and every department of public service. The particular outbreak, coinciding with a similar outbreak of surra in the Philippines, drew the attention of the University of Liverpool to the disastrous influence of animal diseases on the commerce of the Tropics and was a factor in determining the University to establish a Department of Tropical Veterinary Medicine and Hygiene in association with their School of Tropical Medicine. The imperial importance of the study of diseases of animals is now recognised by the Universities and the Public Departments and has added appreciably to the dignity of the profession of the veterinary surgeon.

The exigencies of commerce, baffled by disease, have naturally demanded the substitution of mechanical transport for animal draught, but here again we are confronted by the fact that the construction of railways through malarial areas is always accompanied by high rates of disease and mortality. There is scarcely an area of activity in which a knowledge of the conditions of health and hygiene in the Tropics is more important.

But the larger operations of commerce in the interchange of products between the component parts of the Empire in temperate and Tropical zones are conducted mainly by sea, and here again we find that the removal of masses of tropical products is attended with the same danger as the removal of men and animals. The sea-borne commerce of the Tropics has, therefore, to contend with the formidable obstacles of quarantine. Scientific knowledge of the origin and processes of tropical diseases has already done much to modify the laws and regulations affecting quarantine. The facilities offered by the Suez Canal for the introduction into Europe of the diseases of the East, in particular plague and cholera, led to the Venice International Sanitary Conference of 1892 and the Paris Convention of 1894. To reconcile the interests of personal and family security with the exigencies of trade and shipping is one of the gravest responsibilities the Governments of tropical Colonies have to undertake.

The Venice Conference and the Paris Convention had for their object to reconcile these conflicting interests and to regulate on scientific principles the periods of detention and the processes of disinfection. Although all our tropical Colonies did not become parties to the Paris Convention, they have all in the enactment of laws relating to quarantine had the same object in view. But there is still much to be done, and my own experience has convinced me that a scientific knowledge of the origin and processes of disease—both of men and animals—bears nowhere more intimately on the commerce of our tropical dependencies than in the enactment and enforcement of laws and regulations relating to quarantine.

Essential to the economic development of the Tropics is the security of their sea-borne commerce. The health of our sailors in tropical waters, and of our soldiers in tropical fortresses and defended coaling stations, is, therefore, a national asset of value. Some years ago it was the policy of the Imperial Government to make the Island of St. Lucia a defended coaling station of the first importance in the Caribbean Sea. Fortifications and barracks were constructed at great cost, but the troops had hardly been transferred to them when an epidemic of yellow fever broke out among the sailors of the training squadron which happened to be in the harbour, and the soldiers of the garrison. As I was Governor of the Windward Islands at the time, I can speak from experience of the serious consequences of this incident, and I can assert with confidence that it would not have occurred had the nature of the infection been understood as it now is. I believe that the preventive measures adopted against yellow fever since the discovery of the infecting agents have been eminently successful in St. Lucia. While speaking of the results of tropical diseases research as affecting our naval and military forces, I cannot refrain from a word on Colonel Bruce's work in the subtropical island of Malta. Up to three years ago the admissions to hospital of men suffering from Malta fever amounted to a considerable reduction of the strength. The research work of the Mediterranean Fever Commission, which led to the discovery that goats' milk is the agent of infection, has stamped out the disease, so far at least as our soldiers and sailors are concerned. The problem of securing complete immunity for the civil population is a question of expense.

And now one word on the imperial aspect of tropical disease research as an agency of good government and civilisation. The development of our tropical territories is carried on almost universally by workmen of Asiatic or African origin under the supervision of a handful of Europeans. Administrative efficiency was long seriously impeded by the difficulty of finding qualified candidates for employment in regions where even a short period of service brought almost certain sickness and probable death. Hardly fifty years have elapsed since these considerations determined the Government to withdraw from all our West African Settlements, reserving only a single naval station for the control of the slave trade. Wilberforce's schemes for the civilisation of Africa through the agencies of industry and commerce were ridiculed as impossible by reason of the climate. Scientific research has now analysed the vague generalisation styled "climate," and found that tropical diseases are specific infections by discovered agencies working in accordance with ascertained natural laws. And already the knowledge has effected such a change in the conditions of life that appointments in Africa are eagerly sought for by officials and administrators of proved ability in the imperial service. But the functions of the Medical and Health Departments have a much wider range than even the security and comfort of European officials. The most successful missionary enterprises I have known have been those which have most closely associated religious teaching with the practice of medicine, and more or less directly with industrial work. In the nature of things it must be so. It is no exaggeration to say that the history of the Tropics, prior to European occupation, has been a record of plague, pestilence, and famine, battle and murder and sudden death. No wonder that communities living in so malignant an environment have thought it more politic to propitiate the spirit of evil than to appeal to the goodness of God. No wonder that fetishism flourishes in all the lower strata of tropical civilisation.

We offer these communities a new dispensation, a new order of things. We endeavour in the first place to relieve them of the environment of plague and pestilence by the methods of science, and so teach them by practical demonstration that science is merely a right interpretation of the ordinances of Nature and the will of God. We shall encourage them, relieved from plague and pestilence, to work out their own salvation from famine by developing the resources of the soil by industry. And in the new environment thus established we promise to save them from battle and murder and sudden death by the civil and military arms of a just and efficient administration.

And here let me suggest among the imperial aspects of the Medical School of St. Thomas's Hospital, the part it may play by educating selected students of medicine of tropical birth and origin to co-operate with us in extending the benefits of European research and study over the whole vast area of the King's tropical dominions. There can be no more effective method of extending that sense of loyalty which has been finely declared to be the cheap defence of nations.

In conclusion, I may remind you that the imperial aspects of tropical disease research are now fully recognised by the Colonial Office, the War Office, and the Admiralty. Having held office as Governor in tropical Colonies throughout the period of Mr. Chamberlain's administration, I should be derelict from my duty were I not to pay my tribute to his services to the cause. His successor, Mr. Lyttelton, established in 1904 a Committee of the Colonial Office to advise on the administration of the Tropical Diseases Research Fund, and it may be hoped that no changes of parties or persons will be allowed to interrupt the continuity of service of this Committee.

In calling your attention to some imperial aspects of the study of medicine, I do not under-estimate the importance of others. My long official life has led me to divide all diseases of the Empire into two groups —diseases of civilisation, and diseases that have their origin in uncivilised communities, but are distributed by civilised agencies. Both groups are of equal imperial concern, and offer an equally honourable career to the students of St. Thomas's Hospital Medical School.

# Clinical and other Notes.

## A CASE OF PERITONITIS WITHOUT PERFORATION IN ENTERIC FEVER. OPERATION—RECOVERY.

By Captain S. M. W. MEADOWS.
*Royal Army Medical Corps.*

The following case occurred in the Station Hospital, Mian Mir, and in view of its comparative rarity is, I think, worthy of record.

Private H., 1st West Yorks Regiment, was admitted to hospital on November 30th, 1905. He stated that he had been feeling ill for about ten days, and that for the last two days he had been attending hospital complaining chiefly of cold, sore-throat, and general malaise; he also had some pains in the abdomen, and diarrhœa. On admission, he looked pale and ill, and complained chiefly of his throat, which was slightly congested. Temperature 103° F.; pulse 94; respiration 20. On examination *râles* and rhonchi were heard over both lungs; distinct tenderness over splenic region; splenic dulness increased, bowels loose, motions yellow; no spots. On the night of admission he complained greatly of frontal headache and seemed very drowsy. On the fourth day of admission his case was diagnosed as enteric fever, and the patient was accordingly transferred to the enteric ward. Here he was treated with Burney Yeo's mist. chlorine, ℥i., every four hours. He progressed satisfactorily up to the tenth day of admission, when, in the morning, he had a small hæmorrhage from the bowel. This was followed by a much larger one in the afternoon of the same day. Tinctura opii, ♏xv., was given, and there was no further recurrence until the thirteenth day after admission, when he lost a considerable quantity of blood. Adrenalin, 1 in 1,000, ♏xx., every two hours for six doses, and then four hourly, was given. The same night he was very delirious, and it was necessary to give him morphia, ¼ grain, after which there was no further hæmorrhage. In the early morning of the sixteenth day of admission, and approximately the twenty-sixth day of the disease, he had a rigor. The temperature fell to 100° F., and subsequently to 97° F. The pulse was uncountable. He almost at once began to complain of abdominal pain; there was no vomiting.

When I saw the patient he looked extremely ill. Pulse quick, feeble and irregular. The face had an earthy pallor and was pinched and drawn. The hands and lips were twitching, and he lay on his back with the legs drawn up. The abdomen was distended, rigid and very tender all over, especially down the right side. The liver dulness was obscured, but not lost. There was considerable collapse. A consultation was held, and perforation of an internal viscus was diagnosed. It was decided to operate at once. Chloroform having been administered the abdomen was opened in the middle line by an incision about 3 inches in length, commencing above the umbilicus. It was at once noticed that no gas escaped when the peritoneum was incised. The peritoneal cavity contained a quantity of slightly turbid fluid which was quite sweet. The intestine was carefully examined, but no signs of a perforation could be detected. Acute peritonitis existed, and was most intense opposite the intestinal ulcers and round the ileo-cæcal valve, and lymph was being uniformly deposited on the whole of the small intestine. The intestinal ulcers could be plainly seen and deep ulceration was present. There was some distension of the gut. The peritoneal cavity was washed out freely with normal saline solution at a temperature of about 100° F., and the wound was closed with silkworm-gut sutures. No drainage was used.

The patient stood the operation well, and on returning to bed appeared to be better. Nutrient enemata were given four-hourly for the first forty-eight hours, and morphia, $\frac{1}{4}$ grain, when necessary. Liq. strych., ♏v., was given hypodermically every four hours. On the fifth day after operation the wound was dressed, and on the tenth day the stitches were removed. The wound was then firmly healed. From this point on he made a good recovery, but the convalescence was somewhat prolonged owing to the presence of two large bed-sores over the sacrum.

A year after the operation I saw the patient in Rawalpindi. He had just completed a march from Mian Mir. The scar had stretched somewhat, but was quite firm. He told me that he had enjoyed excellent health, and had no further abdominal trouble since the operation.

*Remarks.*—I presume that the peritonitis was due to extension of the inflammation through the intestinal walls, their resisting power having been lowered by the intense inflammation; the only other explanation of the condition being that a minute perforation occurred which had become automatically sealed, although I do not think that this was the case, as nowhere was there any heaping-up of lymph, neither was there any gas in the peritoneal cavity. Unfortunately, in the hurry of the operation, none of the fluid in the abdominal cavity was preserved for examination. Spencer states that peritonitis occurs in the three stages of enteric. The first occurs long before the ulceration reaches the peritoneum, the second during the middle of the disease, and the third in the later stages, when deep ulceration is present. In the third stage only 10 per cent. recover, laparotomy holding out the only chance of recovery. It is interesting to note that Widal's test was not obtained until the sixty-fifth day of disease, although two attempts to obtain it had previously been made.

# ANEURISM OF THE INNOMINATE ARTERY. SIMULTANEOUS LIGATURE OF COMMON CAROTID AND SUBCLAVIAN ARTERIES.

By Major D. LAWSON.
*Royal Army Medical Corps.*

Gunner J., R.G.A., was admitted to the Royal Victoria Hospital, Netley, on March 11th, 1908, with aneurism of the innominate artery, for which he had been invalided from India. He was a stout, very muscular man, with a short and very thick neck. There was no conclusive history of syphilis. He stated that he believed that he had strained himself in March, 1907, when lifting heavy weights, but felt nothing more of the occurrence till June, 1907, when he first commenced to feel pain and pulsation below the right clavicle.

When admitted to hospital at Netley, he had a large aneurism of the innominate, with marked expansile pulsation and a loud bruit, which could be traced up the right carotid and along the subclavian, and could be heard, but very faintly, in the left carotid. The tumour could be felt behind the clavicle. He had a frequent brassy cough, which had developed about three weeks before reaching Netley. He complained of constant pain and the pulsation. He was kept under observation till April 6th, and during this time the aneurism increased considerably in size.

On April 7th he was anæsthetized with A.C.E. mixture. The subclavian artery was ligatured in the third part of its course. Owing to the short, thick, muscular character of the neck, the artery where it was ligatured was 3 inches deep from the skin. The artery did not rise into the neck, but on emerging from the thorax turned sharply across the first rib. Immediately the skin had been sutured a second incision was made, and the common carotid was ligatured opposite the cricoid cartilage. Both arteries were ligatured with thick kangaroo-tendon. During the twenty-four hours subsequent to the operation he had considerable anæsthetic sickness, and complained of some headache, also probably due to the anæsthetic. There were no cerebral symptoms, except a little giddiness when rolled over in bed during the first three days; the arm remained warm and comfortable.

Pulsation first commenced to return in the radial at the wrist on the fifth day. The wounds healed by first intention. When first dressed on April 14th, there was considerable heaving, but no expansile pulsation in the tumour, probably due to the rise and fall of the solidified aneurism with the pulsation of the innominate. Since that date he has made steady progress. The tumour cannot be felt at all. There is a very slight bruit to be heard over the innominate. Pulsation is limited to the enlarged supra-clavicular and vertebral arteries carrying on the collateral circulation. All pain, cough and sense of pulsation have gone, and the patient is up and walking about. The pulse in the wrist is still small, but the hand and arm are warm, and in no respect different to the condition before the operation.

## NOTES ON A CASE OF RUPTURE OF THE SPLEEN.

By Captain J. TOBIN.

No. 5333 Dr. I. C., Depôt, Lincoln Regiment, aged 26, died on May 5th, 1908, from hæmorrhage, the result of rupture of the spleen. A *post-mortem* examination was made, and on opening the abdominal cavity a large quantity of blood-stained fluid welled up, and on exploration many large blood-clots were found. The spleen as seen *in situ* showed a rent across its internal surface to the extent of 2 inches, and receding from this surface into the spleen substance were portions of an infarct (*ante mortem* in character) composed of organised blood-clot. On removal, the spleen substance was found very friable, and on section the outline of an infarct could be made out, and across the base of this was situate the rupture. There was a history of a blow having been administered over the left side, but on very careful examination no marks of violence could be seen or fracture of ribs elicited. He was said to be subject to attacks of fever from time to time, and had served at Malta, South Africa and Egypt.

Osler states that occasionally rupture results from the breaking of an infarct, and that infarct may follow the formation of thrombi in the branches of the splenic artery in cases of fever.

I have notes of another case of rupture of the spleen occurring in a Private of 2nd Battalion Hampshire Regiment, who was a subject of malignant malaria, attended with frequent attacks of fever. One Sunday morning before proceeding to church he was ordered to tighten his belt, and in the act of doing so he was seized with sudden severe pain in his left side; he was taken to hospital, where he died in a short time. A *post-mortem* examination revealed an enlarged and very friable spleen which had ruptured.

Manson, speaking of enlarged spleen following malaria, says: "Enlarged spleens are easily ruptured by a blow on the abdomen. In a malarious country a coolie goes about doing his work in an ordinary manner although he has a spleen in his abdomen nearly twice the size of his head, which might easily be ruptured by a blow. This is a fact to be remembered in administering even mild corporal punishment to natives. Europeans have more than once been tried for manslaughter in consequence of neglecting it."

## A CASE OF NERVE INJURY FOR DIAGNOSIS.

By Captain G. J. STONEY ARCHER.
*Royal Army Medical Corps.*

On December 23rd, 1907, Driver M., Army Service Corps, was playing football in Dublin, and during the game he received a severe blow on the outer and posterior aspect of his left shoulder from another man's shoulder, which threw him forward on his left elbow. For about five minutes he had severe shooting pains in his "funny bone"; he was, however, able to finish the game, and for the rest of the day felt no injurious effects from the accident. He was also able to use his fork at dinner and to drive his waggon from the railway to the barracks here in Belfast.

The following morning when he awoke he was unable to move his arm, but otherwise felt perfectly well. On admission to hospital all the muscles of the arm from the deltoid downwards were found to be absolutely and completely paralysed. Sensation, both to a light touch and to the prick of a pin, was almost normal, but firm pressure caused a feeling of heat; he also complained that his hand and forearm felt cold during the day and very hot at night. He could accurately locate a touch on any part of the arm, but sometimes made mistakes with regard to which finger was being touched. There was no pain or tenderness in any part of the arm, shoulder, neck or spine; pupils and knee-jerks were normal. All the muscles reacted readily to both the galvanic and faradic currents.

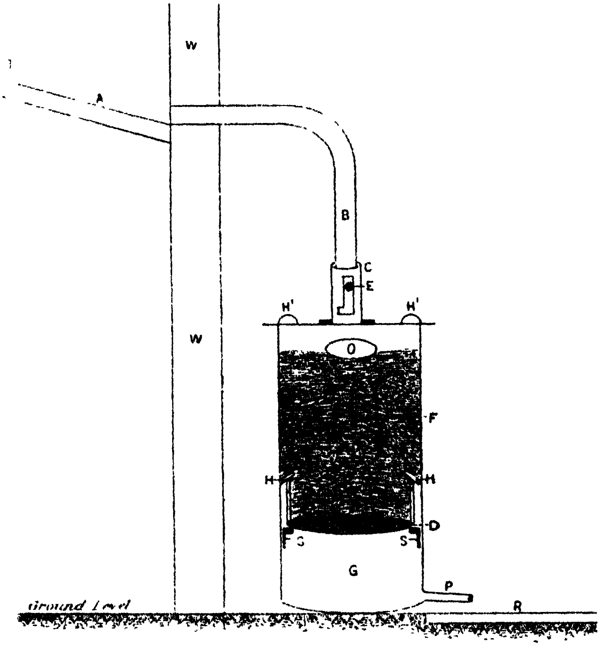
Massage and the faradic current were applied daily to all the muscles, and in a few days the slight sensory symptoms passed away; but it was three weeks before he could make any movement in the affected muscles, and then only the very slightest movement of flexion in the little and ring fingers. At the present time, nearly two months after the accident, he still has no power in the extensor muscles of the arm, forearm or hand, but he can contract all the flexor muscles, though only in a very weak and partial manner.

This case was shown at the last meeting of the Ulster Medical Society and aroused keen interest. Several different opinions were advanced as to the cause and site of the lesion. The difficulty is to account for the delay in the onset of the symptoms and the complete paralysis, accompanied by only very minor sensory symptoms. I would like to hear the opinion of other officers on this unusual case.

# A SIMPLE FORM OF GREASE-FILTER FOR COOK-HOUSES IN INDIA.

By Lieutenant-Colonel A. E. MORRIS.
*Royal Army Medical Corps.*

The accompanying diagram represents a grease-filter which has been in use for the past year in connection with the cook-house sink of the Station Hospital, Jubbulpore, and it has proved so successful in working that the following description is published in the hope that it may prove of interest.



A, Sink; B, bent pipe; C, connecting pipe; D, diaphragm; E, screw; F, upper part containing dry grass; G, lower part; H H', handles; P, purified water pipe; W W, cook-house wall; R, drain; S, strut; O, splay.

Those officers of the Corps who have served in India are no doubt familiar with the large iron receptacles, painted white, which are to be seen outside the cook-houses of British troops, to receive the sullage water from the sinks. These receptacles are emptied into special carts in which the sullage water is removed to a distance and buried in trenches. The great disadvantage of the system is that, if the cart is delayed or the cook uses too much water, the receptacle overflows, the ground around becomes fouled with greasy water, and flies are attracted. For some reason not understood, no sullage cart is allowed for Station

Hospitals, and the officer commanding has to arrange as best he can for the disposal of the cook-house sullage water. Owing to the large proportion of grease and extraneous matters it contains, the water cannot be allowed to flow over absorption gardens, as an insanitary condition would result from the putrefaction of the grease and the clogging of the ground.

My attention was directed to this subject shortly after my arrival in Jubbulpore in September, 1906, and it was evident that if some simple and inexpensive method of removing grease and other matter in suspension could be found, the water might be disposed of in absorption gardens, in the same manner as water from ablution rooms. After a series of experiments, more or less successful, with various filtering media, the filter about to be described, in which dry grass is used, was adopted. The one in use at the Jubbulpore Station Hospital has been working over a year and has never given the slightest trouble; the effluent water is clear and free from grease, and flows on to a bed of Guinea-grass in a corner of the hospital garden. The sweeper cleans the wire gauze and puts in fresh grass daily, the old grass being burnt in the destructor. A second of these filters has been in use for the past nine months in connection with the sink of one of the cook-houses in the British infantry lines, and it has also been completely successful.

*Description.*—The grease-filter not being required for use as a receptacle, as the water is strained off immediately, is much smaller and consequently cheaper than the ordinary receptacle. Those in use are made from oil drums and are 16 inches in height and 11 inches in diameter. The drum is divided into two compartments by a diaphragm of strong galvanised woven wire-gauze, which rests on three struts set in the sides of the drum, 4 inches from the bottom. Two handles are fixed above to remove the gauze for cleaning. Near the bottom a piece of ¾-inch pipe, 4 inches long, is let in, to allow the filtered water to drain away, and the top is covered in with a piece of iron plate, 2 inches larger in diameter than the drum. The plate has two handles fixed on its upper surface, and a circular hole 1¾ inches in diameter is made in the centre to receive the connecting pipe. The lower compartment of the filter is empty, while the upper is filled with dry grass, broken short, and on the centre is placed a flat piece of stone to act as a splay and so prevent the greasy water forcing its way direct through the grass. The water is conveyed from the sink to the filter by a curved pipe, 1½ inches in diameter, and connection is made by a piece of pipe of a larger diameter, 6 inches in length, with a bayonet catch to hold it up; this piece slides up and down on the fixed pipe, and its lower end when down fits into the hole in the lid of the receptacle.

*Advantages Claimed.*—(1) The initial cost and up-keep are much less than the ordinary pattern of receptacle. To make up the filter costs about 5 rupees, and as it does not require to be moved it lasts much longer than the receptacles, two of which, costing 8 rupees each, are necessary, and as they are constantly being moved they only last about one year.

(2) If the grease-filter is adopted sullage carts can be abolished and the water disposed of in absorption gardens, thus effecting a further large saving to the Government.

(3) The filter is not liable to overflow, as the water runs off at once. The effluent being free from grease, flies are not attracted, and they can have no access to the filter itself.

## SANITARY AND MEDICAL CHARGES IN INDIA.

By Major W. TIBBITS.

*Royal Army Medical Corps.*

There is perhaps no more conservative portion of the Empire, as regards the organisation of the medical services, than India. Changes have always come about many years after their adoption at home and in the Colonies. We have only to instance the regimental system, abolished at home in 1873, but continued in India in a modified form as late as 1882 or thereabouts. Even to this day the shadow of the past still clings to India.

Officers of the Corps are detailed to the medical charge of a unit, which comprises the charge of the officers and their families, and the sanitary duties in connection with the unit. There is no such appointment as "Medical Officer in Charge of Officers, Women and Children" as we know it at home and in the Colonial stations. It would appear that the conservatism above referred to is the only reason why the present method of apportioning duties still continues.

The advantage of having one medical officer in charge of all officers, (except staff), women and children in the station is, I think, obvious. It is an economy of labour as regards ourselves and the greatest advantage to the different units in the station. Everybody knows who is the proper medical officer to apply to in case of sickness, and the constant changes, so undesirable from every point of view, are avoided. I know personally of a case in which a medical officer has been in sanitary and medical charge of no less than four different units in the course of a year, and these frequent changes are unavoidable under the present method in India.

I therefore advocate the appointment of one medical officer to the charge of all officers (except staff), the women and children and the family hospital, that when possible he should be a specialist in the diseases of women, and that he should do no duty in the Station Hospital. The appointment should be made as permanent as possible, say for two years.

Next, in regard to sanitary duties, I would refer the reader to an article in the JOURNAL of April, 1906, by Lieutenant (now Captain) C. A. J. A. Balck, R.A.M.C., headed "Regimental Sanitation in India." He suggests the appointment of a Station Sanitary Officer, or "Medical Officer of Health," to each station, and with his suggestion I think many will agree. Frequent changes in appointments to "sanitary charge" of units would here again be avoided. The officer appointed would, as Captain Balck advocates, be the technical adviser of the Senior Medical Officer on all sanitary matters and keep a diary for the Senior Medical Officer's inspection. He would necessarily have to be a specialist in sanitary science and would carry out all bacteriological work of the station. I would further advocate that he perform all duties in connection with the inoculation against enteric fever of all drafts and regiments arriving in the station, including the keeping up of the statistics of inoculation, thus obviating the necessity for the so-called "attached" medical officer to newly arrived regiments in India for this purpose. In this way the inoculation statistics of the whole station would be under the control of one officer. We should thus have three appointments in every station, except, of course, in the very small ones, viz.: (1) Officer in medical charge of officers, women and children, and family hospital; (2) Station Sanitary Officer; (3) Staff Surgeon. In medium-sized stations, two of these appointments might be combined.

I venture to put forward the suggestion that, were such a scheme as I have tried to indicate adopted, it would result in an all-round advantage, not only to ourselves, but also to the several units comprising the various garrisons in India.

## A PLEA FOR A REALLY SANITARY INVALID'S URINAL.

BY LIEUTENANT-COLONEL T. DU B. WHAITE.

*Royal Army Medical Corps.*

A GLANCE through the catalogues of most purveyors of surgical and medical appliances will at once make it apparent that the inventive genius of man has, at any rate, not been idle in the matter of contriving urinals for the use of bedridden patients of both sexes.

The forms depicted are many and various, and the quaint twists and contortions may enhance the outward beauty of the utensil; but an examination of the inside of a broken urine bottle will open the eyes to the necessity of having one of such a shape that all parts of the interior should not only be accessible for cleaning, but also open to inspection. The accompanying sketches on a reduced scale (about a quarter size) show the form of urinal at present in use in military hospitals, and also of my proposed improvement in design.

In the former (fig. 1) "dead angles" are shaded and show clearly that, viewed from the mouth AB, the portions bounded by the lines DE and CF can only be got at for cleansing with difficulty, and cannot be inspected at all. In these situations the solid constituents of the urine are apt to become encrusted on the inside of the vessel, and form a nidus for the growth of all kinds of germs; and patients suffering from bacilluria might easily become foci of infection through the medium of the urine bottle.

We all know that, theoretically speaking, disinfection after use should render the urinal perfectly safe and reliable, but the danger lies more in dirt concealed that in that which is obvious to the most casual observer.

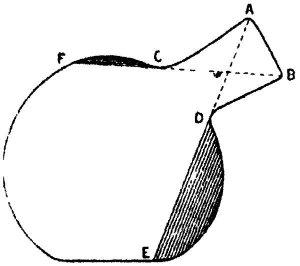


FIG. 1.—Present pattern urinal.

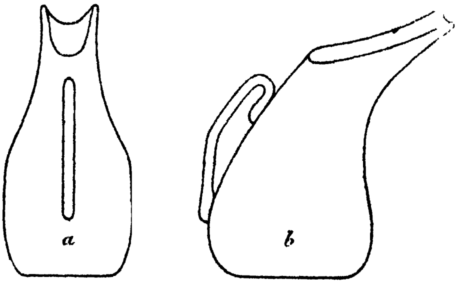


FIG. 2.—Proposed improved pattern. *a*, Back view; *b*, side view.

Glass urinals are, of course, the ideal, but I fear their brittleness and greater cost would be points against their universal adoption in the Service. Being therefore obliged to stick to earthenware, let us have one without angles, and so shaped that all parts of the interior can be inspected at a glance.

In fig. 2 is shown a design for a urinal without "dead angles," a firmer base to stand upon, and less easily upset than the present urinal, the width at the bottom being almost the maximum.

I have seen many urinals with more "dead angles" than the one from which my illustration is taken. The small recess at the summit of the body, viz., fig. 1, FC, continues around the base of the neck and merges in the greater recess DE in front. It is out of reach of any but an unusually long finger, and needs a wire or bent stick to clean it efficiently; but, as it is above the level at which urine stands in the bottle, it is not of so much consequence as the recess DE.

# AMBULANCE STRETCHER SPRINGS.

By Major S. F. CLARK.
*Royal Army Medical Corps.*

Surgeon-Lieutenant-Colonel Kilkelly's note in the April number of the Journal emboldens me to draw attention to the arrangements which exist in the New South Wales ambulance waggons, with the object of saving, as far as possible, a lying down patient from the jolting which is to some extent unavoidable in any vehicle. Each waggon can take two stretcher cases, and has four springs fixed on its floor—two for each stretcher. Each spring consists of a curved piece of iron, about 1 inch wide and ½ inch thick, with a length just sufficient to allow of the handles of an open stretcher resting in the wing at each end (D). The spring is bolted to a wooden block, which is hinged to the floor of the waggon, so that the whole arrangement may lie flat when it is not in use. In some carts the floor is cut away to the exact shape of the spring—wooden block and all—so that when the arrangement is laid flat nothing whatever projects above the floor level. An extra piece of board has to be put underneath to strengthen the floor when this is done.

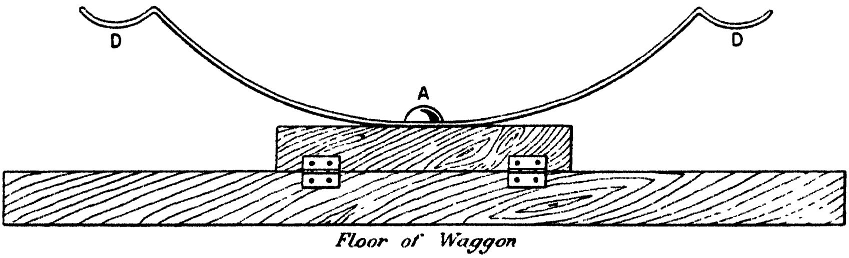


Fig. 1.

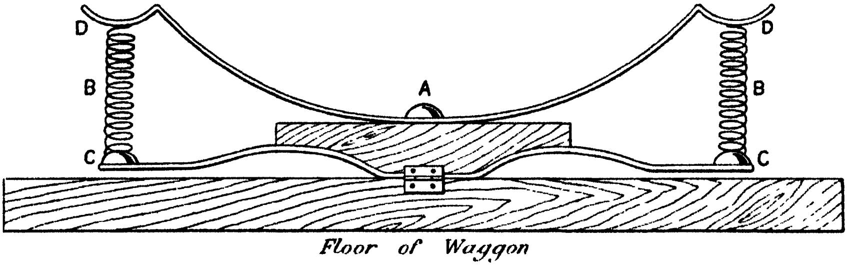


Fig. 2.—A, Head of bolt fastening spring to wooden block; B, spiral spring fitting round iron button, C.

The spring has a tendency to flatten out in time, and to obviate this the pattern shown in fig. 2 has been devised. It has a piece of iron attached to the bottom of the block, lying directly under the spring, and having a large iron button (C) at each end. A strong spiral spring runs from each wing (D) to each button (C), each coil of it just fitting the button. When a loaded stretcher is in position these buttons rest on the floor of the waggon. When a vehicle is being loaded with wounded the spring arrangements are laid flat and the stretcher rolled in. One bearer then runs round to the front, climbs on to the box seat, raises the forward spring, and lifts the stretcher handles on to it by means of the sling which has been fastened between these handles. The other bearers do the same thing at the back of the cart, and the stretcher now lies supported upon the two springs, with its rollers about 2 inches off the floor. The stretcher is not fastened in any way to the spring.

It is evident that a patient who is suspended in this manner must escape a great deal of jolting, and so be saved from a certain amount of shock—to say nothing of discomfort.

I was kindly invited to be present at the General's inspection of the New South Wales Section of the Australian Army Medical Corps, where I saw the whole process of loading waggons fitted with these springs. The loading was done easily and expeditiously, and was not made more difficult by reason of the springs, although it was undoubtedly helped by the lowness of the box seat as compared with our waggons.

If our ambulances ever wear out I would suggest that they be replaced by vehicles built something after the style of the New South Wales waggons. They look handier than ours, are lighter, broader, lower, and fairly strong, as some of those I saw did duty in South Africa. Their fittings include a number of useful articles not found in our waggons, notably some tools and medical and surgical stores.

## SURGICAL OPERATIONS.

THE following table shows the number of operations performed in the United Kingdom, Gibraltar, Malta, and South Africa during the year 1907 :—

| Operations | Number of cases | Results | | | |
|---|---|---|---|---|---|
| | | Completely successful | Partially successful | Failed | Died |
| Laparotomy.. | 30 | 23 | — | — | 7 |
| Gastro-enterostomy | 1 | 1 | — | — | — |
| Gastrotomy.. | 2 | 2 | — | — | — |
| Suture of intestines | 2 | — | — | — | 2 |
| Excision of vermiform appendix | 113 | 108 | — | — | 5 |
| Colotomy | 3 | 2 | 1 | — | — |
| Cholecystotomy | 2 | 2 | — | — | — |
| Intestinal anastomosis | 1 | — | — | — | 1 |
| Closure of fæcal fistula | 2 | 2 | — | — | — |

| Operations | Number of cases | Results | | | |
|---|---|---|---|---|---|
| | | Completely successful | Partially successful | Failed | Died |
| Radical cure of hernia | 391* | 387 | — | 1 | — |
| Abscess of liver | 65* | 39 | 3 | 3 | 19 |
| Aspiration for abscess of liver | 11* | 10 | — | — | — |
| Exploration of liver | 4* | — | — | — | 2 |
| Nephrotomy | 1 | 1 | — | — | — |
| Nephrectomy | 1 | — | 1 | — | — |
| Nephrolithotomy | 2 | — | 2 | — | — |
| Removal of kidney | 2 | 2 | — | — | — |
| Dilatation of the sphincter ani | 5 | 5 | — | — | — |
| Fistula *in ano* | 30* | 27 | 1 | — | 1 |
| For anal fissure | 2 | 2 | — | — | — |
| For imperforate anus | 1 | 1 | — | — | — |
| Hæmorrhoids | 148 | 148 | — | — | — |
| Removal of growth (papilloma) | 2 | 2 | — | — | — |
| Exploratory examination | 1 | — | — | — | 1 |
| Lithotrity | 2 | 2 | — | — | — |
| Cystotomy | 3 | 3 | — | — | — |
| Plastic operation | 6 | 6 | — | — | — |
| Internal urethrotomy | 22* | 19 | — | 1 | 1 |
| External ,, | 1 | — | 1 | — | — |
| Incision of prepuce (circumcision) | 92 | 92 | — | — | — |
| Undescended testes | 2 | 2 | — | — | — |
| Scraping of penis | 1 | 1 | — | — | — |
| Excision of growth (papilloma) | 2 | 2 | — | — | — |
| Varicocele | 41 | 41 | — | — | — |
| Hydrocele | 13 | 13 | — | — | — |
| Radical cure, hydrocele and varicocele | 60 | 56 | 3 | 1 | — |
| Castration | 29* | 27 | 1 | — | — |
| Minor operations, unclassified | 96* | 87 | 6 | 1 | 1 |
| Excision of tumours, malignant new growths | 13 | 12 | — | — | 1 |
| Excision of tumours, non-malignant new growths | 32 | 32 | — | — | — |
| Excision of cyst (mucous) | 3 | 3 | — | — | — |
| ,, ,, (sebaceous) | 19 | 19 | — | — | — |
| ,, ,, (unclassified) | 28* | 26 | 1 | — | — |
| Incision and drainage (abscess) | 166* | 143 | 14 | 6 | 2 |
| Removal of foreign bodies | 20 | 18 | — | 1 | 1 |
| Operations on arteries | 4* | 2 | — | — | — |
| ,, for aneurysm | 3* | 1 | — | — | 1 |
| ,, on veins | 131 | 131 | — | — | — |
| Neurorrhaphy | 4 | 3 | — | 1 | — |
| Neurotomy | 3 | 2 | 1 | — | — |
| Stretching of nerve | 2 | 1 | 1 | — | — |
| Extraction of lens | 1 | 1 | — | — | — |
| Scraping, &c. | 13* | 9 | 1 | 1 | 1 |
| Evulsion of nail | 34 | 34 | — | — | — |
| Breaking down of adhesions | 5 | 5 | — | — | — |
| Skin grafting | 8 | 8 | — | — | — |
| Excision of glands | 76* | 71 | 3 | — | — |
| Erasion of glands | 10 | 10 | — | — | — |
| Incision and drainage of glands | 25 | 23 | 1 | — | 1† |
| ,, of periosteum | 4 | 4 | — | — | — |
| Excision | 2 | 2 | — | — | — |
| Removal of fragments of bone or sequestra | 27* | 21 | 3 | — | — |
| Removal of carious bone | 5 | 3 | 2 | — | — |
| Trephining | 1 | — | — | — | 1 |

| Operations | Number of cases | Results | | | |
|---|---|---|---|---|---|
| | | Completely successful | Partially successful | Failed | Died |
| Un-united or ill-united fracture | 5 | 4 | — | 1 | — |
| Fractured bones | 68 | 61 | 4 | 1 | 2 |
| Reduction of dislocation | 11 | 11 | — | — | — |
| Operation for ankylosis | 11 | 8 | — | 3 | — |
| Aspiration (synovitis) | 1 | 1 | — | — | — |
| Incision with or without drainage | 5 | 2 | — | 3 | — |
| Excision, partial or complete | 5* | 3 | 1 | — | — |
| Arthrectomy | 5 | 5 | — | — | — |
| Erasion | 1 | — | 1 | — | — |
| Removal of loose bodies (cartilage) | 13 | 13 | — | — | — |
| Fixing loose cartilage | 9 | 7 | 1 | — | 1 |
| Excision of articular cartilage | 23 | 22 | 1 | — | — |
| Tenotomy | 2 | 2 | — | — | — |
| Union of divided tendon | 5 | 5 | — | — | — |
| Division of fasciæ | 3 | 2 | — | 1 | — |
| Incision and drainage | 1 | 1 | — | — | — |
| Amputation at hip-joint | 1 | 1 | — | — | — |
| ,, arm | 2 | 2 | — | — | — |
| ,, thigh | 2 | — | — | 1 | 1 |
| ,, fingers | 22 | 22 | — | — | — |
| ,, leg | 11 | 10 | — | — | — |
| ,, toes | 56 | 56 | — | — | — |
| ,, unclassified | 5 | 5 | — | — | — |
| Trephining depressed bone | 4 | 4 | — | — | — |
| ,, antrum | 1 | 1 | — | — | — |
| ,, unclassified | 4 | 2 | — | — | 2 |
| Exploratory incisions | 2 | 1 | — | — | 1 |
| Laminectomy | 1 | 1 | — | — | — |
| Trephining mastoid process | 1 | 1 | — | — | — |
| Mastoid operation | 17 | 15 | — | 1 | 1 |
| Excision of portion of cortex | 1 | 1 | — | — | — |
| Removal of polypus | 5 | 5 | — | — | — |
| For ranula | 1 | 1 | — | — | — |
| Removal of adenoid growths | 6 | 6 | — | — | — |
| ,, tonsils | 18 | 18 | — | — | — |
| For strabismus | 1 | 1 | — | — | — |
| Excision of eyeball | 8 | 8 | — | — | — |
| Evisceration of eyeball | 2 | 2 | — | — | — |
| Removal of polypus (ear) | 8 | 8 | — | — | — |
| Opening of mastoid antrum | 1 | — | — | — | 1 |
| Excision of part of a bronchocele | 1 | 1 | — | — | — |
| Suturing | 6 | 6 | — | — | — |
| Excision of breast (male) | 4 | 4 | — | — | — |
| Paracentesis of pleural cavity | 7 | 4 | 1 | 1 | 1 |
| Incision and drainage | 13 | 12 | — | — | 1 |
| Total | 2,210* | 2,044 | 55 | 28 | 59 |

* Twenty-four cases remaining in hospital at end of the year have not been reported ' successful" or "otherwise."

† Death due to heart failure.

# Reprint.

## TRAINING IN SANITATION IN THE SCOTTISH COMMAND.

By Colonel T. M. CORKER.

*Army Medical Service.*

### I.

The study of sanitation in the Army is a recent movement, and it has not yet reached its ultimate development, but its progress is sure if slow, and its value is becoming apparent to every thinking mind, especially in view of such national questions as loss in war and racial degeneration. The efforts made by the medical officers of the Army have been constant, and are now beginning to bear fruit, more particularly as the lessons of foreign wars have opportunely forced the subject upon public notice.

In the Scottish Command it was determined in 1906, in order to give more cohesion and solidarity to sanitary work, to introduce a "Sanitary Book" in each station as a record of points observed, and as a continuous medium of communication between the officer in medical charge and the officer commanding. The system was subsequently extended to many of the units of the Auxiliary Branches, and in these as well as in the Regular Army all officers have found that office work is minimised, while sanitary action becomes more crystallised, and the mutual relations of the commanding officer and the medical officer are strengthened. The responsibility of the commanding officer for the maintenance of health in his unit, which has of late been insisted upon, has induced each commanding officer to realise more clearly the advantage of having an expert adviser who is practically on his staff. At the same time (in 1906) action was taken in various ways to endeavour to secure the attendance in camp of a due proportion of volunteer medical officers, and to increase their interest in improving camp conditions and extending sanitary knowledge.' It was suggested that reports would be acceptable, and a few officers responded.

In 1907 the War Office directed attention to the training in sanitation at Aldershot of selected men from each regular regiment, to be known as the Sanitary Section. In this command action has now been carried still further, and an attempt has been made to develop similar squads in Auxiliary Units generally. Orders were issued this year to submit definite reports on sanitation for each unit, and a promise was made unofficially that these would be analysed and criticised, and if possible a *précis* compiled. In addition, the Brigadier-Generals commanding Highland and Lowland groups issued sanitary regulations to be observed in each camp. On the whole, a sanitary framework has thus been constructed on which it is hoped that widely extended sanitary knowledge and continued improvement will follow. Both Commanding and Medical Officers manifested interest in the subject, and in every direction an improvement in camp cleanliness has this year been reported.

The Army Council has decided that sanitation will in future form one of the subjects of examination of junior officers for promotion. The Army Council has also issued orders for winter lectures to regular troops in all garrisons. As a corollary it has been directed that in all Auxiliary Units similar lectures will be given, so that when a regiment moves into camp in 1908 the men will not be confronted for the first time with sanitary questions, but will receive a practical object-lesson upon the measures discussed during the winter. It is directed that Medical Officers will lecture on sanitation in its higher planes to officers and all others who care to attend, while the regimental officers themselves give continuous instructions to their N.C.O.'s and men, using as a guide the Manual of Sanitation. In war the State cannot provide an officer to dry-nurse each man. What is needed is to foster the *instinct* of avoiding the dangers that imperil life on active service. It cannot be too often repeated that an officer or man is more valuable to the State in proportion to his ability to maintain himself "fit," and secondly, that the reputation of a commanding officer may often depend on the numbers he can return as fit for duty. In analysing the 1907 reports received (a heavy piece of work), the object kept in view has been not to write a text-book or to attempt literary elegance, but rather to suggest lines of thought and modes of action. It is left to those responsible to think out proceedings that best suit local conditions, and that are most likely to bear fruit in the future, The new Territorial System may alter some internal relations, but will assist in developing the general advance in sanitation which has been initiated, and which now only needs more community of thought.

It may not be out of place to remind Medical Officers of the Auxiliary Forces that room for original communications can sometimes be found in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, and further, that the new Society of the United Medical Services is ready to receive them as members.

In the following notes no reference has been made to individual units by name, but officers will see that their remarks have been read. The aim of the Memorandum is to suggest rather than to criticise.

## II.

(1) *General Instruction.*—It has been noted by several officers that lessons in camp cleanliness should precede training in camp. The matter has been recently dealt with in Command Orders. Medical Officers will give special lectures to both officers and men during the winter, and Company Officers will instruct their companies, using the Manual of Sanitation as a text-book. One Adjutant of Militia reports that he went

through "War with Disease" with his permanent staff, who then assisted him in disseminating instruction daily. This was excellent work. Another officer had extracts from "Health Memoranda" read daily on parade during camp. A useful book is entitled "Notes on Military Sanitation," by Lieutenant-Colonel Elkington.

(2) *Visits to Camp some time Prior to Occupation.*—The Senior Medical Officer or another Medical Officer detailed by him might with advantage visit the camp some time before its occupation. One or two Senior Medical Officers did this. In most camps the water supplies have been examined previously by the Sanitary Officer of the Command, but this should not prevent each officer from gaining all the knowledge he can of water protection of his camp at its source, and in its conveyance and distribution to the troops. In war this duty is one of the most important, as water is, of course, recognised as one of the principal carriers of disease.

(3) *Medical Officer to Accompany Advance Party.*—A Medical Officer from each brigade should accompany the advance party. Did any Senior Medical Officer or Brigade Major direct this? Yet it is very necessary. Supposing even that the water supplies are known to be sound, a camp not already laid out, and not yet in charge of a sanitary section, is very liable to be fouled to such an extent in a few hours that it cannot be thoroughly cleansed in as many days. In some reports this practical point has been noticed. Moreover, a report should be made as to the exact conditions present when the advance party marched in, and as to whether the numerous sanitary addenda have been prepared and details provided. What are these details? It is the quartermaster's duty to satisfy himself that all is right and to take action if it is not. The medical officer should note the facts as well and strengthen the action of the quartermaster. For instance, some reports indicate that a few camps had not been left sufficiently clean by the outgoing regiment. Carelessness of this kind may have serious results on active service or on manœuvres if another regiment has to occupy the same ground, and it is surprising how easy it is for a regiment, whose lines, when not carefully scrutinised, exhibit no particular disorder, to reveal a contrast when tents have been struck, cooks have moved off, and latrines have not been thoroughly dealt with.

(4) *Protective Work in Adverse Weather.*—Some regiments found their camping-ground clean, but wind and weather against them. What is the remedy? The weather must be watched, and ropes and drainage looked to more particularly. Every small eminence must be utilised when the weather is bad, and the military precision of ordered lines must give way for the time to the practical utility of tents on dry land. The occupants of each tent should look to its drainage system, not forgetting the little bank of earth at the perimeter, or a stone under the central pole. Tent boards might be placed on stones, bricks, or even dug-out hillocks of earth. Stones and bricks may be used and long grass cut out to form

paths. There are numerous ideas to be thought out, and most of those noted are culled from the reports.

(5) *Cleanliness under Tents and in Tents.*—Only one report mentions that the tent boards were taken up. Some regiments did this once during the week; others not at all, and I have been told that in some seasons tent boards have remained unmoved by any one of successive regiments. On the other hand, an Officer Commanding Militia reports he had it done daily in his unit, with, of course, obvious limitations.

In some regiments the men's kits were exposed outside when the sun shone. In others little of this kind was done, and presumably the cleansing value of sunshine and fresh air was not explained to these men, and a fine opportunity was lost. Up to the present one of the advantages of military training has been the inculcation of discipline of mind and manners. In the future it may be hoped that our soldiers will learn something of the universal factors of health as well. The filthy habit of spitting in tents is commented upon by one Officer Commanding. Remonstrance is of no avail. In tramcars no one pays the slightest attention to "Please don't spit," in spite of the common knowledge that sputum is a potent factor of disease.

(6) *Wastage from Lines and Tents.*—How many regiments provided themselves with tubs or baskets or boxes to receive waste odds and ends? No report mentions these, but they did exist in some units. The canteen contractors have quantities of boxes that can be got for nothing.

(7) *Dining Marquees.*—The use of dining marquees is more generally discussed. Principles of domestic economy are involved. To hire dining marquees costs a certain sum, and, *contra*, to run a restaurant system saves a certain sum. One regiment tried both systems, one for N.C.O.'s, the other for the men, but the question is not discussed to finality. Again, when men eat in their tents waste material is thrown about; but on active service dining marquees cannot be provided. There are thus two sets of contrasting arguments. I have discussed both with commanding officers, and find there is a general consensus in favour of the dining marquee, though it is considered by some to cost more than it saves. Does it? It is certainly a tremendous advantage in wet weather, and in this way an aid to volunteering generally. I advise using marquees in these camps, and at the same time training men in tent cleanliness, so that when marquees are not available the camp does not become unbearable from smells and flies, as one sometimes experiences in India and Africa.

(8) *Bivouacs.*—With the subject of tents is closely associated a knowledge of the structure of bivouacs. Blankets provided with brass rings form part of the equipment of our new field ambulances, and their use should be studied. Some excellent plates and notes on *tentes d'abri* are given in the "Field Service Pocket Book for 1907" (Oliver and Boyd, Edinburgh), in which everyone, officer and man, should also study the articles on first aid and sanitation.

(9) *Number in a Tent.*—Some officers note that there were eight men in a tent. It is useful to observe all such details. Very curious variations are occasionally observed when N.C.O.'s are not watched. Had any officer studied the ventilation of these tents, and the fact that under certain conditions there is none, and how to meet the difficulty?

(10) *Officers' Servants' Carelessness.*—It is observed in one report that officers' servants are regarded as exceedingly slack in cleanliness. This is because they trust to their masters to relieve them from the usual penalties of misconduct. It is a point to be observed. What does each officer think his own servant does with waste water? Can the procedure be improved upon? Waiters in messes in barracks and the officers' servants often live and sleep and act in a manner that ought not to be permitted, and that is entirely due to want of supervision. This is a point for all officers to consider.

(11) *Boots and Socks and Foot Parades.*—The preparation of men for camp life and unusually severe marching has been touched upon by several. Ought not the men to have special preparatory marches during the preceding ten days? Have their boots been examined? In one unit it is noted that the men are very carefully shod by special agreement with one firm. In dubbin used? What extra boots or shoes are taken to camp? One senior medical officer notes an improvement in the darning of socks. This observation alone conveys an impression of the care in minutiæ that this officer practises. It is in such things success lies. Every sportsman knows how an apparently trifling detail may destroy his day's sport. Yet many men still pretend to regard details in sanitary matters as faddism. They condemn the thing they are unable to understand.

No time and trouble expended on these minor points are thrown away. Good shooting and good marching power are two of the most important assets of the well-trained soldier. To these we must add a third, "ability to remain fit"—"fitness." In some battalions the care of the feet is specially considered. Have any feet inspections been carried out by the company officers themselves? I was once associated with a line battalion in which officers and men were alike smart, and this duty became on the march a routine custom. Have any instructions been issued as to blistered feet, and do the men know how to take care of them? What do you think of the Continental systems? Here we have a subject which is capable of great expansion in its business aspect as well as its practical issues. Can the commanding officer make any contracts or agreements that will tend to make the regiment better shod than others? Were canvas shoes carried as an alternative, so as to permit of rest and change? What form of sock is the best? Can the men wash them? What affections follow upon wet feet? A soldier living under perfect conditions otherwise may be made absolutely unfit for duty through even minor accidents to his feet—the feet that are relied on to carry both him and his rifle. The officer commanding one brigade speaks of the effect of the sandy beach in cleaning the feet. The subject has evidently been considered by some, but it is deserving of greater prominence.

(12) *Eyesight and Physique.*—As marching, shooting, and "fitness" are the requisites, eyesight requires attention. What is the condition of eyesight in the regiment? In the German Army spectacles are universally worn if needed, as in civil life. Is it so among the less intelligent of the men in Volunteer regiments, or have you men who actually do not see and cannot see, being equally unable either to hit a target or to recognise whether friend or foe approaches his post? This is one of the important matters affecting recruiting, and it is well to draw attention to this and to other physical infirmities. That some anomalies exist was once made very clear elsewhere. A Royal Army Medical Corps officer rejected over forty incapable and infirm men who, on inspection, he found had been retained year after year by ancient custom. Such customs are bad in their effect on the regiment itself, as other men fail to grasp the meaning of "efficiency." A man with unsatisfactory vision may be fitted with spectacles (to his great advantage in civil life as well), and he may be of much service to his country, but not, as a rule, in the shooting line.

(13) *Cookhouses.*—The place where officers' and men's food is prepared should be immaculately clean. Only in some of the regiments that I was able to visit this summer did the conditions approach a proper standard. Among points observed, the principal was a tendency to throw refuse anywhere; food was kept on the floor of the cook's tent; refuse tubs were leaking; washing of dishes was carried on so as to saturate the ground with impurities. How are these conditions to be improved? Who is responsible? Does the orderly officer visit these cookhouses and the cooks' tents daily, inside and outside, and report what he actually sees? Does the mess president also visit them, and the regimental medical officer? It is a mistake to suppose these conditions are inevitable, but the cooks would have you think so. They are so only when the cooks are not supervised and controlled. As to leaky tubs, an agreement is made with the contractor. Have you seen the contracts? If not, get them. One commanding officer understood this and acted accordingly. Another commanding officer thinks it is desirable to distinguish more closely the difference between the straw filter-tub, a comparatively recent invention, and the refuse tub by painting them different colours. As to the straw tub, its main object is to strain off the grease that chokes drains, and every development of it will be welcomed. One commanding officer says that filter-tubs choke. Surely not, if straw be constantly renewed.

What form of cooking-range is best for camp use? Rather a big question and very important. Some use the linked camel pattern; others camp kettles on an Aldershot arrow, and others possess another pattern. Which is the best? One regiment on manœuvres cooked in the open without building up sods or digging trenches of any kind. Surely this does not economise fuel. It is surprising how well the natives of India make up a fire-place with three or four stones. Some regiments had master cooks trained at Aldershot. It was interesting to discuss points with these intelligent N.C.O.'s, and some had their kitchens in excellent order, and their cooks were very clean and evidently under control.

There is a new invention for cooking on the march; cooking takes place as the cart moves. It is worth studying.

In different reports it is noted that (1) latrines, (2) washing-places, and (3) dry-refuse pits are thought to be too near the cookhouses. All such remarks should be forwarded in a special letter while the regiment is in camp. They will now receive due consideration.

(14) *Food.*—One senior medical officer gives a valuable detail as to the hours at which the meals took place. I am inclined to think that the intervals were too great. We know the workmen's habits. Ought not a man who breakfasts at 6.30 a.m. to have his next meal before 1.30 p.m.? Field days? Why should he not take with him some prepared food and then have the balance with his tea? It may not be possible to take the cooks for the day, or to provide road-cooking plant. If the field day be extended men may not get their dinners until late in the afternoon. Information as to food and cooking is always interesting. Money is often wasted. A regiment marches on its stomach—as well as in its boots.

"The cooks being members of the regiment." This is sound from an active service point of view. Do some regiments hire their cooks? Our armies would do better, perhaps, if more men knew how to cook, as do so many French soldiers. What are the systems in Continental armies, and how do they work?

(15) *Drink.*—It may not be generally known that in the British Army a hundred years ago or less every soldier was forced when abroad to drink his ration of rum—about one-third of a pint—whether he liked it or not, and twenty-five years ago every oarsman in 'Varsity races had to drink a daily ration of port as part of his training. These customs have disappeared. In some regiments the canteen is open before dinner, and the drink is consumed on an empty stomach. In others, a man takes his beer to the table with him. I am very sure that the former system is quite wrong. The sale of drink, the testing of beer, the interests of the canteen manager, the commission on the sale of beer, are all matters that indirectly concern both the individual volunteer and our national life, and are worthy of the fullest consideration. The connection between drink, crime, and degeneration is very close. The upper classes have diminished the amount they consume, but the poorer classes have not. If the Territorial Army could include a temperance (not a teetotal) movement, in addition to this sanitary movement we are now discussing, as part of its general influence, it would be an additional source of national benefit.

(16) *Water.*—On the golf links the inclusion of "casual water" involves no penalty, but to the soldier it is distinctly dangerous. It is one of the principal points that the company officer and the section commander have to keep perpetually in mind. It is useless to talk of testing. The environment or the natural history of a pool or a stream should be enough for a sensible man.

The camps are so well supplied that illness derived from water is, as a rule, very unlikely, but great mischief may happen during marches. How is this to be provided against? There are two main principles to act on: (1) Give the man safe water to carry, and forbid him to drink any other except by permission; (2) when all supplies fail, the officer commanding the section must be the judge of what is safe.

The latest idea is a filter water-cart, a filter that is part of a cart, and that will purify casual supplies. Next year this will be on view and utilised in most camps. But what are the "corporal and three" to do? In Continental armies and in our own an effort is being made to find a tablet to purify water. If every medical officer would study this subject during the winter and next camping season we might attain the result we seek.

One report gives an account of a march to camp. A market ground, a farm, and a field were used in turn as camping grounds. Field latrines are not mentioned in this report. Similar marches were made by Yeomanry regiments. None contain any reference to instructions issued as to roadside water supplies.

In one regiment the officer commanding put his police on the standpipes. In another I saw that the officer commanding evidently did not.

(17) *Latrines.*—Here, again, such ample preparation is made that little is left to be done. One commanding officer reports that he himself visited the latrines. This is the right spirit in which to approach this matter. It is an essential daily duty that should be laid upon the orderly officer. If matters are found unsatisfactory the officer who takes action finds things better next time. Is disciplinary power to be a dead letter in sanitary matters?

Reference is made in some reports to broken seats and latrines left unclean by outgoing regiments; want of scoops; scarcity of paper; need of notices as to use of earth. It would be well to deal with such matters by immediate report when in camp.

Marching regiments say nothing of the new form of parallel trenches. They were used during the Perthshire manœuvres and the men approved of them. One brigade made the quartermaster of the day responsible for cleanliness. This does not obviate the desirability of an orderly officer's visit. In another, a man from the sanitary squad was on duty every two hours to see that earth was thrown in. Constant inspection, constant instruction to the men themselves, and a liberal supply of all addenda will produce good results when N.C.O.'s and respectable men set the example. The medical officer should note in this and other matters exactly what he observes to be wrong, and send the sanitary book at once to the commanding officer. This is practical work.

(18) *Urinals.* — What would ordinary men do at night? What happens if a man who has recently recovered from enteric soils the ground round his tent? This is the point to explain to the men themselves. Where the soil is sandy, holes dug in convenient places are sometimes sufficient. But in camps occupied for a long time, such as Stobs, Barry, and Irvine, other measures should be adopted. How are tubs to be obtained? How many per company? Where would you place them?

It is presumed the great success of the use of oil is understood.

(19) *Disposal of Horse Refuse.*—The commanding officer of a Yeomanry regiment found himself in increasing difficulties as to removal. The farmers are glad to get the refuse, but all contracts should insist on daily removal. In a heavy battery it was destroyed daily, but report does not say how, although we may suppose by fire. Was a destructor built?

(20) *Destructors.*—Is it understood how to build a destructor, and which is the best form—the American or the circular? Every unit should build one, both for use and for practice. The principle is not widely different from that of the Aldershot kitchen, but any experimenter may devise a new form.

(21) *Washing and Bathing.*—As already noted, one commanding officer put police on the stand-pipes. The drinking supplies should be regarded always as *sacro-sanct.* It would be an excellent thing for our troops if we could infuse them with the religious attitude of mind of Indian natives regarding food and water.

One report deals with the advantages of sea-bathing. Were any men trained in the method of restoration of the partially drowned? Another officer reports that he had water for hot baths ready from 2 to 6 p.m. Officers and men often long for a hot bath. Perhaps he will favour us with details as to cost, arrangements, &c. All practical hints come in useful on campaigns.

A report says pits near ablution benches were choked, but why is not clear. Would straw filters have assisted to prevent this? Fresh pits were dug in one unit.

(22) *Clothing.*—Except reference to boots and khaki cap covers, no remarks have been made upon men's clothing or its management. The subject is of great importance, and a War Office Committee is at present discussing it particularly. But every officer has his own opinion, and practical ideas are valuable.

The difficulty during the Perthshire manœuvres was to keep the men fairly dry, as the weather was very bad and they had practically no change. One day when it was raining heavily I waited to see a certain regiment come into camp, a regiment in which the arrangements are always sensible. Each man had marched and worked from 4 a.m to 4 p.m. in his khaki serge only. The commanding officer was justified in marching without an overcoat, as its weight would have been so very fatiguing. But the men were wet through, and it is a question whether it is not desirable that the Army equipment should include a very light waterproof cape, with a collar, and reaching from the neck to the hips. A sportsman usually has one, and a soldier is essentially a sportsman. Personally, I would not undertake any expedition by land or sea, on duty or for pleasure, without a waterproof of some kind in my kit, even if I myself had to carry it.

As to management, on arrival in camp, after being fed, each man received from a waggon his overcoat and, rolled therein, a change of underclothing. These things he put on while his suit was dried in neighbouring buildings.

All reports might usefully include details as to what was done in emergencies of any kind.

(23) *Drying Tents.*—On service there are no drying-rooms, and in these manœuvres instructions were issued to devise some plan for drying clothes. In one unit a brick pyramid was built in a marquee, but there seemed to be too much fire and flame. In another a pit was dug and wood burnt therein, but it soon burnt out. Neither plan seemed very successful, and perhaps a better idea is to build a long trench and to fill it half with wood and half with stones, so that the glowing stones therein can retain and give out heat for a longer time with less fuel. Strings or ropes were stretched across the tents on which to hang the clothing. Some success was attained, but the matter requires a good deal of thought and experience. As to the drying-houses in the permanent camps, further reports on these will be useful next year.

(24) *Tent Boards, Bedding, &c.*—One brigade reports that no tent boards were issued, and none were needed, as the soil was dry and sandy. Do the medical officers always know what each man has in the way of bedding? Tent boards, straw sacking, four blankets, and an overcoat seem a great deal under ordinary conditions, and one can hardly suppose so much is needed. It would be well for both commanding officers and medical officers to think the matter out and offer some reliable data and suggestions. When this amount is compared with a soldier's allowance on service, or during the manœuvres—viz., his overcoat, two blankets, and a waterproof sheet—it is evident that there is room for some doubt as to the necessity of the larger issues.

(25) *The Ideal Soldier.*—What every officer aims at is to collect a company of intelligent men who can march, shoot, and take care of themselves. These are three requisites. Perhaps the best example we can find is the backwoodsman of our Colonies. What we have to do is to try to turn raw levies, who have nothing in their favour but a certain standard of intelligence and physique, into ideal soldiers. It is a hard

task, but everything that tends to make him think, and to realise that he may at times be left to himself altogether, tends also to impel him towards the desired goal. And therefore it is that we endeavour to instil such practical lessons as the care of his feet, socks and boots, and precautions and cleanliness in food and drink. This paper has touched upon at least a score of matters he should know something about, and probably it would not be difficult to find as many more.

(26) *Soil.*—A very important subject: notes on its nature in each camp and observations on drainage, ground water, &c., are very useful, as also the remarks made as to agricultural tiles for one camp.

When drainage is difficult it is evident that no grease whatever should be allowed to get into the drains, any more than into house drains, and the idea should be carefully explained to the men themselves. Straw filters should be in constant use, not only in cookhouses, but even in ablution stands where it is possible to adapt them, and where it is clear they are needed. These straw filters are most excellent; they may be seen in their latest form in Barry Camp.

(27) *Marching.*—The more we deal with our men as a coachman deals with his four-in-hand the better work we get. On a long day's journey he takes them easy and rests when possible, but never lets them get cold and stiff. There is no unnecessary drinking of water. When the time comes for a feed the horses get it.

There should be no such thing as drinking water at the outset. All who have marched much in India know that this water-drinking is a habit and not a necessity. This is a point that the company officers and N.C.O.'s should regard as absolutely disciplinary.

A day's manœuvres sometimes end at some distance from camp, and a march straight back without a rest is very trying. No remarks on marching have been made in the reports; the methods and views of experienced commanding officers and medical officers would have been interesting.

(28) *Field Ambulances.*—It is not perhaps grasped that "field ambulances" have now superseded the old divisional and brigade hospitals. Every medical officer will have to study the organisation and structure of the field ambulance, and every commanding officer in the new Territorial Army must know their exact relationship to his unit. It is evident from the reports received that in some brigades an analogous system is carried out, and that sick are transferred to the present bearer companies in quite the right way. In these the change will present no difficulties.

In some regiments a clearer understanding is desirable. Some march without a tent for sick, and a Red Cross flag to mark it, and others have no trained regimental stretcher-bearers. Ideas as to the provision of medical material are apparently very sketchy, although there is no reason this should be so, as the regulations deal with the matter, and state when and where medical panniers are issued, &c. In some units no plain record of sick is made, but in others it is clear that my circular on camp hospital work, issued to all field hospitals in 1906, has been studied and acted upon. I think it would be well for all auxiliary medical officers who have not already done so to begin at once to assimilate the details of hospital management, and if any points are not understood a memorandum direct from the senior medical officer to the Principal Medical Officer Scottish Command will be fully replied to. It is pointed out that courses for Volunteer medical officers are held at our larger military hospitals.

(29) *Staff Rides, Manœuvres.*—It is somewhat surprising to find, both in war and on manœuvres, that clear orders respecting field hospitals are so frequently omitted. This is a point that calls for attention alike from brigade commanders and senior medical officers. The field ambulances, for instance, should occupy a certain position on the line of march in an enemy's country, and this position should be notified in division and brigade orders, just as are instructions regarding other units. They occupy a variable length in column and area in camp, according to the size of the whole force, and this must be allowed for in orders which refer to time factors, crossing bridges, encampments, &c. These variations should be charted from field tables, and the differences and functions between field ambulance, clearing hospitals, &c., fully investigated. There are many details that all officers, especially those likely to be employed on staff duties, should be familiar with.

(30) *Sanitary Squads.*—In regular regiments one point the War Office desires to elucidate is whether this squad should consist of pioneers or not. One commanding officer answers that in barracks it should not, as the pioneers have their own work, but in camp it may, as the pioneers' barrack work disappears. Pioneers are usually respectable, sensible men, and seem well fitted for the duty. It is very clear that on no consideration should men of doubtful character or low intelligence be included, as it requires men of some character and influence to carry out duties very analogous to and quite as important as those of military police. It is as police they should be regarded, and it is desirable that they carry a special badge. The sanitary squad has certain work to do, but it has also to direct and control those who fail to carry out orders.

One N.C.O. and eight or ten men are ample for a regiment. On a field day the section should not stay in camp, but should march out, and upon receiving orders from the brigade commander set to work to plan a regimental camp, choosing and preparing (under orders of the medical officer and quartermaster) the sites for kitchens, latrines, ablution places, &c.; posting one man as a sentry on water supplies; building refuse destructors, &c.; and shortly before marching off everything should be again put in order. This drill is described by one medical officer and is very practical. Cooks, if they have come, may also set to work, and the regiment may dine out and rest comfortably.

(31) *Lectures—First Aid Work; Drill on Field Days.*—Lectures on sanitary matters should certainly include some first aid instruction on a few important points, *e.g.* (1) how—at times—to let an injured man alone; (2) how to keep him from bleeding to death; (3) how to prevent a broken bone from breaking through the skin; (4) how to resuscitate the partially drowned, &c.

Beyond this, each medical officer has his own ideas as to what should be included in the lectures, and, judging from the points mentioned in the reports, those lectures will be essentially practical and useful not only in camp, but at home as well, a point more than one senior medical officer has rightly insisted upon, and which is of infinite importance. The teaching should be such that all may apply it to home life as well as to camp work; and, to go further, if it were possible generally to disseminate the idea that volunteering means not only fine patriotic spirit, but also has associated with it useful and practical teaching in the best methods of retaining health and the manly physique upon which each man prides himself, it would perhaps be an additional incentive to men to enrol themselves.

A first aid and ambulance drill should be carried out on field days as if in action. Some commanding officers fully co-operate in this, but others do not. The matter should be dealt with by brigade commanders. The practice should be carried out on the lines of the incidents of war, wounded being ordered to drop out as previously arranged, collecting parties taking them to dressing stations where an operation tent is pitched, a fire lighted, &c.

(32) *Medical Officers in Camp and their Reports.*—It is perhaps as well that the necessity of medical officers attending camp in the proportion of at least one per battalion has been so thoroughly discussed during the last two trainings, as with increased sanitary work it is absolutely essential, and as under the new Territorial schemes it will unquestionably be ordered. It is reported that in one case two medical officers had 3,000 men (four regiments) to look after. This was wrong. In another the senior medical officer rightly transferred an officer from one regiment to another temporarily. In a third unit there were four medical officers, but no instruction in sanitation was given. It is evident that brigade commanders and senior medical officers have some administrative work to do in these matters. The duties of medical officers will be practically the same as hitherto, and hence the effort made in this Memorandum to direct attention to the salient points of camp life ought not to be unproductive.

The form the reports have taken in some cases is very unofficial, and not as directed in King's Regulations. If the reports had been submitted immediately upon the closing of the camp, some would not perhaps be so bald and perfunctory. The simple assurance that everything is as perfect as possible and that there is no more to say would raise in some minds a reasonable doubt to the contrary. Other reports were very full indeed, and one officer has taken much trouble in preparing a useful map of his camp. Nevertheless very few reports are at all comprehensive, and the aim of this Memorandum has been to suggest matters all of which are more or less intimately connected either with the personal welfare of the man, the general advantage of the regiment, or its relation to other units. The Memorandum is, as it was intended to be, mainly suggestive.

## III.

The object of the action taken in regard to sanitary work for the last two years is in a measure now attained. It was the custom in the past to regard the week's training of Volunteer regiments as a military outing, during which, of course, the camp was to be kept commonly clean. But such ideas as the scientific consideration of each factor in the maintenance of health, or the general instruction of N.C.O.'s and men in the rules of health as applicable to their lives in and out of camp, had not attained to any practical development. The influence of the junior officers is not sufficiently utilised.

It is clear, however, that a great deal of interesting and instructive work may be carried out with a little organisation, and the structure of the new Territorial Army will assist in further advances on the same lines. A yearly report may be made by each medical officer, passed through his senior medical officer, and finally consolidated in a general report. With a little practice the Territorial Army in Scotland should become an authority in itself as to what the high standard relating to all the conditions of the soldier in camp life ought to be.

The reports already submitted indicate the ability which can be brought to bear, and the discussions I have had with officers commanding brigades and battalions, with senior medical officers and other medical officers, show that all that is needed is to bring the study of the laws of health and efficiency into greater prominence.

I would suggest, then, that each unit, while aiming at a general advance in theory and practice, should also choose one particular point for special study, *e.g.*, care of the feet, water on the march, field cooking, &c., and should carry the study not only up to, but, if possible, beyond the standard laid down in the British and Continental armies, and in this, as in other matters, knit more closely a community of interest and sympathy between the foreign service army with the home defence force.

A very great national benefit is closely bound up with the extension of sanitary principles that may be imparted under a military system. Men that join the ranks rarely know anything of the rules of health. Many officers are almost equally unconversant with scientific facts on a higher level. The general ignorance of the nation is the chief cause of the constant loss of life due to consumption, typhoid fever and infectious diseases; and there is the well-known fact that we all despise what we are unfamiliar with.

So far as the Army is concerned, what is chiefly needed is that *all* officers should clearly understand how closely associated are our losses in war with our national ignorance, and, secondly, what a very wide field of interesting and curious knowledge lies just above and beyond the ordinary level of what is usually spoken of as a clean barrack or a clean camp. To take one prominent instance, we may order a man of low-grade intelligence not to spit in his room, but it requires some understanding, although not really very much, to grasp the connection between the germ in his sputum and the death of another man some years later from consumption. There is practically in the same series, but further along the line, the tremendous question of the increase of insanity in the British Isles. These are points closely connected with our military strength as a nation. The wasted money, spent in all directions on inferior specimens of mankind, definitely affects our potential energy.

In this argument it is assumed that the nation is actually losing ground through ignorance of the rules of life. Is this the case? Does the reader desire to deny it? If he does, then one more thinking man is likely to be included in the field of action, for I am well content to leave him to his ultimate conclusion. Once he has begun to enquire it will not be long before his influence is thrown into the desired scale.

As officers we have two ways of attaining our ends. One is by the issue of orders, and by their enforcement; the other is by the spread of knowledge. By habit alone our men will attain to clean barracks, clean camps, and a certain mechanical care on active service. This is the most we can attain to "by order," and it is not comparable with the result we shall obtain in the Army and in our national life when the *reasons* for these rules and regulations have been thoroughly understood. But to effect this *all* officers must combine in maintaining a steady, continuous movement year after year. A national effort is requisite to attain a national end, and as matters now stand the officers of the British Army constitute the vanguard in the movement.

The factors considered essential to secure the nation from physical degeneration are therefore a competent knowledge of these laws of health, combined with daily practice in the maxims thereof, so that in home life or on active service officers and men *instinctively* do the right thing, and the women and children, in whatever grade of society they may be, do the same. It may be argued that it is the duty of the Education Board to produce these results. But the Education Board has so far very signally failed in its duty in this respect to the nation, and it has remained for the Army to add to its ancient protective services the new one of sanitary education, so that when a soldier returns to civil life he is a better citizen in this respect at least. Many of us regret that the present temper of the country prevents some system being developed that would permit us to assimilate the best educational points of the old Greek physical methods and those of the modern German, with perhaps a little Spartan custom and severity thrown in to modify hysterical humanitarianism. This humanitarianism, the reaction from the brutality of earlier ages, regards the care of anything *below* the level of a healthy standard as more important than the conservation of the best. Many would rather subscribe to a home for lost cats than give a guinea to a fund for workmen with ten healthy children. The conservation of energy is not among our scientific principles, and hence it is that in every direction spring up these homes for the preservation of our waste products, the products we ought not to have among us, whereas the development of the sanitary education that would eventually render such homes unnecessary is too evidently of minor importance.

We are now promised an improved policy, but this should not prevent us from realising the immense good that may be effected by imparting that education which is above all the most important, education in "The Care of Life," under the ægis of our military discipline.

# Translation.

## THE NATIONAL PHYSIQUE AND ITS INFLUENCE ON NATIONAL GREATNESS.

(From the *Kaikosha Kiji.*)

TRANSLATED BY CAPTAIN E. F. CALTHROP.

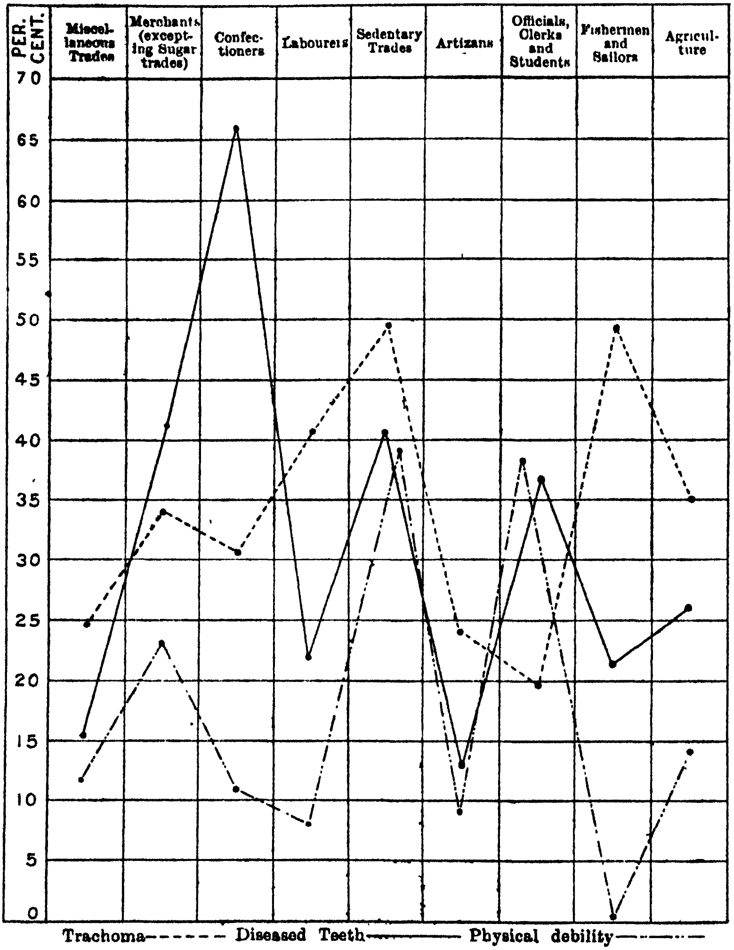
*Royal Field Artillery.*

THE War Office statistical records, while embodying much that is contained in this article, are not inclusive in some ways, and too voluminous in others to give a general and at the same time correct impression. For instance, the War Office report assumes that all recruits in Classes A and B are perfectly sound, which is a grave error. The following statements are founded on the examination in 1907 of 11,577 recruits on the register of the Sakura regimental district, drawn from a population of 677,188, and I consider that they form a basis on which the condition of the whole country may be judged.

*Varieties of Diseases.*—By far the most prevalent disease is trachoma (of the eye), with which 4,073, or 35·2 per cent., were affected; the next most prevalent is decayed teeth, 3,155, or 27·2 per cent.; the next, physical debility, 1,832, or 15·8 per cent. These three form the principal causes of unfitness, the remainder constituting 30·5 per cent. Taking the population of this district as a basis, we find that the number of males in

Japan, between the years of 16 and 60, is 13,854,122, from which we can estimate that the number of persons suffering from these three diseases is :—

| | |
|---|---|
| Trachoma | 4,876,651 |
| Diseased teeth | 3,768,321 |
| Debility | 2,188,951 |
| Other diseases | 4,125,507 |



The prevalence of the above varies according to occupation. The first is most prevalent among fishermen and sedentary trades, together over 49 per cent. Diseased teeth are most frequent among sugar trades and confectioners, over 66 per cent.; while debility is most frequent in sedentary trades, among officials, students and clerks, together between 37 to 39 per cent. We find that with the exception of trachoma, which does not affect the constitution, diseases are most prevalent among the governing and leading classes, classes of most importance to the nation, that is officials, clerks, students, and those belonging to sedentary professions, as can be seen from the chart on the previous page.

The wide prevalence of trachoma, and the fact that it does not affect the constitution, leads to the inclusion of a large number of trachoma cases among those passed fit. The number of cases of the disease among the different classes of recruits is shown in the following table :—

CASES OF TRACHOMA AMONG DIFFERENT CLASSES OF CONSCRIPTS.

| | A | B (1) | B (2) | C | D | E | Total |
|---|---|---|---|---|---|---|---|
| Number of men .. | 5,015 | 2,668 | 1,104 | 2,044 | 643 | 103 | 11,577 |
| *Cases*— | | | | | | | |
| Suspicious .. .. | 57 | 6 | 3 | 2 | 0 | 0 | 68 |
| Very slight.. .. | 1,793 | 433 | 126 | 285 | 29 | 23 | 2,689 |
| Slight .. .. | 25 | 548 | 108 | 178 | 24 | 2 | 2,885 |
| Medium .. .. | 0 | 31 | 189 | 55 | 5 | 1 | 281 |
| Severe .. .. | 0 | 1 | 4 | 123 | 22 | 0 | 150 |
| Total .. .. | 1,875 | 1,019 | 430 | 643 | 80 | 26 | 4,073 |
| Percentage .. .. | 37·3 | 38·1 | 39·0 | 31·5 | 12·4 | 25·2 | 35·2 |

The causes of short stature are inter-marriage, heredity, locality, and mode of life. The first three causes are difficult of investigation, but some light may be thrown on the fourth from an examination of the tax returns, which show that by far the largest number of undeveloped persons is found among the poorer classes, the percentage being 16·5 among these; the lowest number being among the middle classes, viz., 2·8 per cent. ; and an increase showing among the upper classes—6·5 per cent.

These results may be put down to the following causes : Full development, suitable nourishment and exercise ; incomplete development, insufficient nourishment and excessive labour, or sufficient nourishment and insufficient exercise.

From a comparison of the different classes (fit or unfit) of recruits with the different classes of tax-payers, we find that the middle classes, that is, those paying from 5 to 20 yen a year taxes, contain the greatest number in A Class. A comparison of the number of conscripts in A and B Classes in the Sakura regimental district for the last five years shows that the percentage has risen from 71·3 in 1903 to 75·4 in 1907. We have yet, however, no certain evidence that the national physique is improving, the increased number in A and B Classes being due, in a measure, to the introduction of the two-years system and the increased number of conscripts required ; while against this must be put the undoubted increase of disease due to increased difficulty of livelihood, the spread of civilisation, and increase of inter-communication.

The number of men taken for the colours in the Sakura district and the number of men of suitable age for the last five years are as follows :—

| Year | Men available | Men taken for the colours |
|---|---|---|
| 1903 | 10,199 | 13·3 per cent. |
| 1904 | 12,398 | 12·2 „ |
| 1905 | 12,074 | 14·2 „ |
| 1906 | 13,456 | 13·3 „ |
| 1907 | 14,020 | 21·7 „ |

# Reviews.

THE REVOLT IN HINDUSTAN, 1857-59. By Sir Evelyn Wood, F.M., V.C., Methuen, 1908. Cr. 8vo, pp. 367.

These pages were originally published in eighteen issues of the *Times* in October last, when the fiftieth anniversary had revived the memory of the Indian Mutiny. Since then the author has been able to improve his work through the suggestions of friends and correspondents. He tells us in the preface that he has re-written the chapters about the siege and capture of Delhi.

The smoke has long cleared away, and the manner in which the events are treated by Sir Evelyn Wood reminds us that they have now entered into the domain of history. The author deals very freely with the character and conduct of the officers who conducted military operations, and adopts a softened tone towards the vanquished.

Although not in India during the first year of the mutiny, Sir Evelyn came in time to take part in the pursuit of Tantia Topi, and won the Victoria Cross at the battle of Sindwaha. Clearly he saw enough to give to his narrative that true and vivid colouring which is wanting in the work of the civilian compilers. To judge from the list of books which he presents, his own historical research is not extensive ; but his account of the events is generally accurate, and his judgment correct.

In his opening chapter, Sir Evelyn states the causes of the revolt, amongst which he gives prominence to the annexation of Oude and the greased cartridges. The seizure of the kingdom of an old ally, because the country was ill-governed, appeared to the native mind as arbitrary and unjust. Sir Evelyn tells us that, by the passing away of the king's rule, the sepoys from Oude lost the privilege which they greatly prized, of the right of appeal, whilst on furlough, to our Resident for speedy justice. On the other hand, Mr. Gubbins in his "History of the Mutinies in Oude," assures us that the intercession of the Resident was rarely of any advantage, and that the sepoy class was that most benefited by the annexation of Oude, since it freed the ryots from the encroachments of the taluqdars. The revolt was certainly owing to a combination of the sepoys of the Bengal army to defend their caste threatened by the greasing of the cartridges for the Enfield rifle. Whilst we wonder at the ignorance and supineness of the army chiefs at that time, we need not be sure that such blunders against native beliefs and prejudices will not again be committed by men of commonplace intellect, put into power by inconstant majorities. This very year we have witnessed the marvel of the Boers of the Transvaal, after being conquered, being allowed, with the consent of the British Cabinet, to frame insulting regulations against our Indian subjects, who aided us in the war, and which regulations they firmly united to resist.

In so short a history one scarcely expects descriptions of individual combats; but Sir Evelyn details a number of such encounters with all the zest of a gladiator. Briton and Hindustani meet with sword, pistol and bayonet. Sometimes it comes to butt-ends of muskets, or they use fists, roll and wrestle. These descriptions, if genuine, must come from the combatants themselves, and naturally redound to the credit of our countrymen. Sir Evelyn thinks that "individually the Hindustani is brave, and does not hesitate to engage a European in single combat; but collectively, probably from want of confidence in his leaders or comrades, he will seldom meet his foe in serried line with sword or bayonet."

It may be truly said, that although amongst the Hindustanis there is a sprinkling of very daring men, in general they have less hardihood than Europeans; they are better marchers than English soldiers, but not so strong in the arms. Sir Evelyn does not notice that after the capture of Delhi, when the mutinous sepoys lost the great magazine, they were very deficient in ammunition, and had to turn their muskets into matchlocks for want of percussion caps, with which to meet troops armed with the new rifle.

We do not find from the beginning to the end of the volume any reference to the aid which the military surgeons gave in rescuing the wounded in the field and caring for the health of the troops. But in the past British Army surgeons have sometimes had worse to complain of than neglect, and, if Sir Evelyn knows nothing of the way the soldiers were treated in the hospital tents, he is right not to attempt any remarks on the subject. Napoleon had some praise to bestow upon Larrey, and Wellington upon Macgregor; and perhaps the care of the sick and wounded on a campaign is not beneath the notice of a field-marshal. Sir Evelyn, however, devotes three pages to the gallant defence of a house in which Surgeon Home, with a number of wounded soldiers, was surrounded by the enemy, and for which Home, now Sir Anthony, was decorated as V.C.

The author quotes Sir Henry Norman to the effect that the casualties in action amongst the troops at Delhi exceeded all those in Havelock's, Windham's, Sir Hugh Rose's, and Sir Colin Campbell's operations combined.

A good feature in the book is the discriminating characters of the military leaders, Wilson, Nicholson, Havelock, Outram, Hope Grant and others, as well as of civilians like Dalhousie, Canning, Elphinstone, and the Lawrences.

Referring to Major Hodson, Sir Evelyn praises his services as a light cavalry officer and in gaining intelligence of the enemy's doings, whilst he blames him for shooting with his own hand and without trial three princes of the house of Delhi. In the recently published "Memoirs of Sir Henry Norman," Hodson is also censured for this deed. Norman, who was then Adjutant-General, says that he never heard at the time of the imminent danger of the princes being rescued by an excited crowd, which was presented as the excuse. This is surely a singular lapse of memory on Norman's part, as anyone may see by looking at the letters from Hodson and Lieutenant Macdowell written soon after the event. Moreover, General Wilson, on granting Hodson permission to pursue the princes, added, "But don't let me be bothered with them," a remark quite understood by both. (See "Twelve Years of a Soldier's Life in India.")

The chapters on the relief and capture of Lucknow are written with great spirit and power.

From the shifting course of military operations over different parts of Hindustan it requires some acquaintance with geography always to follow the narrative, nor does Sir Evelyn show much skill in keeping up the connections, and he occasionally breaks off into episodes which are scarcely needed. But viewed as a whole this is a well-written and stirring account of those memorable events.

WILLIAM W. IRELAND.

CLINICAL LECTURES ON THE SURGICAL DISEASES OF THE URINARY ORGANS. By P. J. Freyer, M.A., M.D., M.Ch. London: Baillière, Tindall and Cox. Pp. viii., 425; 141 illustrations. 12s. 6d. net.

In the twenty-five clinical lectures contained in this work the author gives a comprehensive account of the subject, and offers very clear and definite teaching based on wide clinical experience.

The first three lectures deal with stricture of the urethra, and are extremely good. The subject is one of importance to military surgeons, who will find many practical hints of much value in these pages.

A short chapter on the urethroscope, cystoscope, and other diagnostic instruments follows, and the seven succeeding lectures deal with enlargement of the prostate, including full statistics, with many illustrative cases of the author's operation of total enucleation of the prostate in its capsule. Next come lectures on tumours of the bladder, and on cystitis and prostatitis; and then six lectures are devoted to the subject of stone in the bladder, of which the author has had unrivalled experience.

Five lectures are concerned with surgical diseases of the kidney and ureter, and a rather short account of tuberculosis of the urinary organs forms the concluding lecture.

Where all is so good it is an invidious task to criticise, but one or two points seem open to question. The administration of quinine to prevent urethral fever appears to be based on the resemblance of the symptoms to those of malarial fever rather than on any sound clinical or pathological reasoning. No warning is given of the danger of conveying infection by catheterisation of the ureter, a method the author recommends in preference to using the urine separator, while only one form of the latter is mentioned. Massage of the prostate in chronic prostatitis is strongly condemned, apparently on æsthetic grounds. The value of X-rays in the diagnosis of renal and ureteral calculi is distrusted, though the latest methods in the hands of experts hardly ever give fallacious results. No mention is made of recent bacteriological methods of diagnosis and treatment of tuberculous affections. The index is very scanty for a volume of this size.

These are but minor blemishes on the work that ought to be read by every surgeon. The book is handy in size, well illustrated, and written in a style that makes it exceedingly easy to read. It can be strongly recommended to all readers of this JOURNAL.

## HERNIA, ITS CAUSE AND TREATMENT. By R. W. Murray, F.R.C.S. London: J. and A. Churchill, 1908. Price 4s. 6d. net.

In this small book of ninety-nine pages the author states a strong case in favour of the opinion now generally held by operating surgeons, that inguinal hernia in adults is nearly always congenital in origin, and that a more or less extensively unobliterated processus vaginalis is the true explanation of the condition. In support of this opinion is mentioned the existence of a potential hernial sac, found *post mortem* in subjects who have not been known to have suffered from hernia. In this connection, it seems to us that scarcely enough stress is laid upon the presence in most cases of hernia, as seen upon the operating table, of a more or less firm fibrous ring almost invariably found in the sac about the region of the internal ring: it has always appeared obvious that this fibrous ring is the site of imperfect obliteration of the processus, and that when hernia first appeared in adult life this same annulus had been a sufficient barrier to the descent of hernia up to the date of a certain great stress.

Mr. Murray gives some interesting points with reference to hernia in animals, which though well known to veterinary surgeons, are not commonly appreciated by medical men.

For femoral hernia, simple ligature, with abscission, of the sac is all that is said to be necessary, leaving the femoral opening to close spontaneously; this is the method followed with success by Ochsner. Similarly, arguing on the saccular theory, it is recommended that umbilical hernia in female infants should be submitted to operation, preferably at about the age of 12 months. To the Army surgeon who during his career necessarily practises in many regions, and may have opportunities of seeing patients of many races, the chapter on the geographical distribution of hernia is of much interest. There is an interesting appendix of tables of incidence of the various herniæ in both sexes.

We strongly commend this little book to all medical officers who operate for the radical cure of hernia.

M. P. H.

## THE TREATMENT OF GONORRHŒA IN THE MALE. By Charles Leedham-Green, M.B., F.R.C.S. Second Edition. London: Baillière, Tindall and Cox, 1908. Pp. 160. 5s.

Having reviewed the first edition of this work in favourable terms, we had hoped to have been able to do the same as regards this second edition, but candidly we confess that we think the latter has not kept pace with treatment. For instance, no mention is made of the newer methods of irrigation (by interrupted currents) for gonorrhœa, the description of Bier's treatment is of the most meagre kind, and the serum treatment of gonorrhœal rheumatism is not mentioned. We would also have thought that some allusion would have been made to Wyndham Powell's excellent urethroscope, and to his still more ingenious instrument for slitting up obstructed urethral follicles. On the other hand, all the useful information contained in the first edition is maintained.

F. J. L.

DIETS IN TUBERCULOSIS, PRINCIPLES AND ECONOMICS. By Noel Dean Bardswell, M.D., and John Ellis Chapman, M.R.C.S. London: Oxford Medical Publications, 1908. Pp. 184. Price 6s. net.

A grant from the Government Grant for Scientific Investigation was made by the Royal Society towards the expenses of the various researches recorded in this book. The work described extended over some seven years, and the authors' final report to the Royal Society is contained in its pages. The volume is divided into eight chapters, with an appendix.

The first chapter details the scope of the inquiry as follows: (1) The best principles on which diets for consumptives should be constructed. (2) The nutritive value in terms of proteid and total calorie value of the diet which is suitable for the treatment of the average consumptive; in short, a standard diet. (3) The best lines upon which such an efficient dietary can be economically constructed for actual use. (4) The minimal cost at which a suitable dietary can be bought retail. The fourth of these principles the authors wisely regard as important as the first three. They point out: "It is no use telling a consumptive working man earning 25s. a week, and with a wife and family to keep, to take three pints of fresh milk and plenty of meat and butter daily. We have often heard this counsel of perfection given in hospital out-patients' departments to a consumptive who had less than 8d. a day for the purchase of his food. Some precise information as to how he might provide himself with an adequate diet for this 8d. would be far more useful."

The authors discuss at considerable length the construction of a standard dietary. They refer briefly to Chittenden's "Physiological Economy in Nutrition," but do not refer to his second book, "The Nutrition of Man," published last year. They dismiss the remarkable work of this Rousseau of Dietetics with the statement that "until further work is done" . . . "we cannot accept Chittenden's work as proof of our present teaching as to the dietetic requirements of the average normal person being fallacious." We do not regard this as treating the laborious work of Chittenden with sufficient consideration, and venture to hope that some, at least, of the "further work" will be undertaken by these painstaking and able investigators.

The chapter on the Comparative Economy of a Chief Foodstuffs and the Economics of Diet appeal to a wider audience than those interested in the diets of the sanatoria, and might be perused with profit by officers of the Corps.

The observations on the treatment of consumptives with meat-free diets and others in which much of the proteid is derived from vegetable sources are of great interest, while the directions to be given to patients who are being treated in their homes for tubercular affections are remarkably clear, concise and reliable. They are the only directions we have seen in which the question of economics has received sufficient consideration. The rules might well be reprinted and distributed by Medical Officers of Health.

The book contains a mass of carefully arranged dietetic and statistical tables, and, on the whole, should be regarded as a valuable addition to our knowledge of the exact application of selected diets in the treatment of disease.

R. J. B.

ASEPTIC SURGERY. By Major E. A. R. Newman, I.M.S. Second Edition. Calcutta: Thacker, Spink and Co., 1908. Rs. 5.

This little work was favourably reviewed in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS for March, 1907. The present edition has been largely rewritten and brought up to date. The new chapter on asepsis in obstetric practice should prove very useful. The work can be thoroughly recommended.

F. J. W. P.

AIDS TO OPHTHALMOLOGY. By N. Bishop Harman, M.A., M.B., F.R.C.S. Fourth Edition. London: Baillière, Tindall and Cox, 1908. Pp. 165; 70 illustrations. Price 2s. 6d. cloth, 2s. paper cover, net.

In this, the fourth edition of this well-known volume of the Aid Series, Mr. Harman has replaced Mr. Jonathan Hutchinson, jun., who was responsible for the three previous editions. According to the preface this little volume has been largely rewritten; but even so the small amount of space into which the subject of ophthalmology has been compressed necessarily leads to dogmatism on the part of the author, such as on p. 52, where typical interstitial keratitis is said to be *always* due to inherited syphilis, no mention of tubercle even being made; and in some instances too incomplete description, as for example in the description of the consensual pupil reaction on p. 6, no mention is made of the second eye being shaded from the light; nor in the treatment of conjunctivitis, on p. 17, is argyrol mentioned; nor is the insensitiveness of the cornea referred to in the paragraph on p. 51 descriptive of herpes ophthalmicus. However, the book will doubtless be of use to the student, who prefers a dogmatic statement to a dissertation, and who will nevertheless find the main points of the subject briefly mentioned in this volume. We should prefer a different word to heterophthalmia (p. 65), as it savours somewhat of inflammation, and we certainly dislike the term tobacco *amaurosis* (p. 79), for by amaurosis complete blindness is usually understood. On p. 123, Example III., we fail to see how the left *inferior* rectus can cause "lateral diplopia only." The differential diagnosis of iritis is given in the form of a useful table (p. 58), and the method of retinoscopy described on p. 101 has, in our hands, given more precise and accurate results than the time-honoured "shadow test."

HANDBOOK OF LEGAL MEDICINE. By William Sellers, M.D.Lond., of the Middle Temple and the Northern Circuit, Barrister-at-Law. Manchester: University Press, 1906. Medical Series, No. V.

This book is intended for the use of the legal profession. It consists of a collection of facts of medical jurisprudence compiled from the recognised text-books, especially Taylor's classical work, "The Principles and Practice of Medical Jurisprudence," and Dr. Fred J. Smith's excellent "Lectures on Medical Jurisprudence." The author tells us that he has endeavoured to arrange the book in such a manner and with such explanations and illustrations as, it is hoped, may make medical and surgical problems in civil and criminal cases intelligible to members of the legal profession. The book is divided into sixteen chapters, with, in addition, a short medical vocabulary and an appendix.

The first two chapters are not given any special title, and we think that they might well have been omitted. In writing the first chapter the author assumes considerable ignorance on the part of his readers. It is surely hardly necessary to instruct lawyers of any experience on the occasions on which medical evidence may be required and the shortcomings of medical witnesses.

The second chapter contains the sort of anatomical and physiological facts which are usually to be found in ambulance text-books. We cannot believe that such elementary knowledge will be of real use to jurists, and find the chapter somewhat out of place in a scientific handbook.

The information in the remaining chapters is clear and accurate, and, generally speaking, sufficiently full for the requirements of the lawyer.

The tables which the author has collected from Devergie, Luff, Husband, Dixon-Mann, Guy and Ferrier, Ogston and Woodman Tidy are very valuable, and constitute an excellent epitome of generally accepted opinions on a great variety of points of the utmost importance in medico-legal work.

The book is well printed on good paper, and is by no means unworthy of the young, but lusty, University from which it comes.

KRIEGSWAFFEN UND FELDSANITÄTSDIENST (Weapons of War and the Medical Service in the Field). By Oberstabsärzt Dr. Karl Cron. Part I. Second Edition, revised by Regimentsärzt Dr. W. Raschofsky. Vienna: Josef Safar, 1907. Pp. 69, with 39 illustrations in the text. 2s.

This volume is No. 105 of the army medical publications of Austria. The importance to the army medical officer of a knowledge of weapons used in war is urged. He must be able to understand their peculiarities and differences, not only in order to appreciate the nature of the wounds inflicted by them, but also in order to make correct tactical use of army medical units in the field. The subject is, consequently, divided into elementary instruction in the general and special types of weapons, and into instruction on the manner in which they affect military surgery and military medical tactics. In the first part a description of fire-arms and their ballistics is entered into in considerable detail, with illustrative diagrams. In the second part the energy, mechanical effect, wounding power, &c., are considered mathematically, and many statistics, tables, and diagrams are given illustrating the subject. The most interesting chapters of all are the concluding ones, in which the author discusses the probabilities of being hit during an action, and the zones where the probabilities are greatest or least, and also the proportion of casualties during battle.

The work is technical and scientific in character, and is valuable for those who desire to study a subject that is little studied in our Army, namely, the conditions affecting the movements and handling of medical units during an action.

W. G. M.

# Current Literature.

**A New Method of Destroying Larvæ of Mosquitoes.**—Méd. Major Sauzeeu de Puyberneau, of the French Colonial troops, reports in the *Annales d'Hygiène et de Médicine Coloniales*, 1907 (4), that he is able to destroy mosquito larvæ by using the leaves of the prickly cactus, *Opuntia vulgaris*. The thick, fleshy leaves are cut into pieces and macerated with water. This forms a mucilaginous liquid in a few seconds, and after a time the mucilage floats to the surface and forms a layer on the water which has the same effect as petroleum in preventing access of mosquitoes to the water and in destroying the larvæ by plugging their respiratory tubes, cutting off oxygen. It is not volatile and need not be renewed more than once a month. It is not necessary to macerate the cactus in water; the same result will be obtained by throwing pieces of the plant on the water that is to be treated, although the formation of the mucilaginous film on the surface is slower. The process is simple and costs nothing where the cactus is found. Its only disadvantage, as compared with petroleum, is that it is lighter and more easily blown about with wind on the surface of the water.

W. G. M.

**Disinfection of Urinals.**—Oberstabsärzt Dr. Fichtner publishes experiments with several urinal disinfectants in the *Deutsche Militärärztliche Zeitschrift* of April 20th, 1908. The experiments were conducted in connection with the work of the bacteriological laboratory of the military hospital in Leipzig. The disinfectants tested were: (1) *Saprol* in various forms (saprol for general use, saprol A, B, and C, and "clear," from the chemical factory, Florsheim, of Dr. H. Nordlinger); (2) *Torfit extract* (factory of Grevenberg and Co., Hemelingen, Bremen); (3) *Urinol* (Rosemann and Kuhnemann, Berlin); (4) *Urinal oil;* (5) *Carbol urinal soap* (E. L. Marugy, Aue).

Saprol for general use killed typhoid bacilli in forty minutes in 2 to 2½ per cent. solution in urine; but only when there was no sediment. With a sediment it seemed to have little or no effect. The other forms of saprol, except saprol C, which was similar in action to saprol for general use, was much weaker and unreliable. Torfit extract is intended as a paint for urinals made of torfit slabs and contains creasol and sublimate. The torfit slabs are hard smooth-surface slabs made of peat mould mixed with minerals and disinfectants and made into a hard mass under pressure. There was little or no disinfectant effect by painting with this extract. *Urinol* is a thick oil, with small disinfectant power. *Carbol soap* is not a soap at all, as it will not form a solution in water. It is probably peat mould mixed with crude carbolic acid or tar. It prevents decomposition of urine, but is not a powerful disinfectant. The *urinal oil* is a thick oil smelling strongly of tar.

The general result of the experiments is that saprol for general use is the strongest urinal disinfectant, but that disinfectants of the above nature cannot be relied upon in time of epidemics, and at other times they are not required. In epidemics more certain disinfectants, such as milk of lime, would be used. At other times it is advantageous, however, to keep urinals free from smell, and for this purpose the best plan is to paint the slabs with an oil of which "torfit" extract and urinal oil are good examples. In the military hospital at Leipzig the urinals are made of concrete, and are painted once or twice weekly with saprol C, which keeps them free from odour. It is cheaper than the other disinfectants tried, but is a thin, oily substance and easily washed away.

W. G. M.

**New Surgeon's Pocket Case for the German Army.**—A description of the new surgeon's pocket case for the German Army appears in the *Deutsche Militärärztliche Zeitschrift* of April 5th, 1908. Up till 1900 the surgeon's pocket case measured about 6½ in. by 4 in. by 1¾ in. This was altered in 1900 and a smaller case measuring 5½ in. by 2¾ in. by 1¼ in. was introduced. In both the instruments were carried in pockets in a canvas holder placed in a leather case. The general character of these cases and of the instruments they contained, such as a spatula alongside of surgical instruments, made it impossible to keep them aseptic, and the staff of the "Kaiser Wilhelm's Akademie" have been engaged in designing a case in which the instruments may always be kept aseptic for use in an emergency without immediate sterilization.

The result is the pocket case that is now being issued to the medical cadets in their last session. The principle adopted in the design is to keep the surgical instruments entirely separated from instruments used in clinical examination. Consequently two cases are made instead of one. The first is for clinical examination instruments; it measures about 6 in. by 4 in. by ¾ in. The second is for surgical instruments; it measures about 6¼ in. by 2¾ in. by 1¼ in. The contents of the first case are, a clinical thermometer, a metal spatula, a pleximeter, a percussor, stem of stethoscope, earpiece of stethoscope, centimetre measure, and a magnifying glass. The second case contains only instruments made of metal and a glass tube with suture silk, wrapped in cotton wool and placed in a small metal case. The contents are: a large sized scalpel, small scalpel, vaccination lancet with protector, catch forceps, dissecting forceps, artery forceps, straight scissors, bone probe, ear probe, grooved director with scoop, four curved needles assorted sizes, and a round metal case for the tube with silk. The case is so constructed that the contents cannot become contaminated from outside, and, when they are sterilised, will remain aseptic until required for use.

W. G. M.

**The Medical Service of a Regimental Unit, with special reference to Infantry Expeditions against the Hottentots in German South-West Africa.**—In the sixth number (March 20th) of the *Deutsche Militärärztliche Zeitschrift* for this year, Oberärzt Dr. Ruckert has a long article upon his experiences in the expeditions against the Hottentots, and more especially during the expedition to the Orange River in October of 1905 against Morenga.

The article commences with some interesting notes on the sanitary condition of the troops as regards water supply. Dr. Ruckert says that this was the chief consideration in the selection of camps; the water was examined and guards placed over it, water pools were cleansed, deepened and surrounded with stone or thorn protecting fence, in order to prevent them being contaminated by the men or the transport animals. Clarificacation with alum was not much used, the water in the south being generally clear; still less was the Berkefeld filter used, because the output was too little. Boiling in the form of tea or coffee was the chief means employed to purify the water. Men were prohibited from washing within 20 metres of the pools.

Tents were little used, and protection against wind and sun was constructed out of bushes, stones and sand.

Two kinds of latrines were used with his company. In sandy soil, trenches 5 metres long and the width of the trenching tool (30 centimetres) were dug, and covered over immediately on being used. In stony ground, a shallow pit was dug with pickaxes, large stones or rocks were placed round it and branches of trees were placed over the top. This was done as a protection against the wind, which was liable to carry the contents in any direction into the camp. Much difficulty was experienced in dealing with the carcasses of animals and with kitchen refuse, and with the millions of flies that gathered round these. In sandy soil it was easy enough to bury the refuse, but in rocky ground the only way of disposing of it was to let it dry in the sun, and then burn it with brushwood, previously saturated with petroleum.

Supplies for the men had to come from a distance of 700 to 900 kilometres by wagons which moved slowly, and it was found impossible to obtain sufficient supplies, in consequence, from the German ports In the most southerly districts, therefore, supplies had to be obtained from British territory. Supplies of tinned goods practically failed, and the men were obliged for many months to exist on corned beef and rice, and on the flesh of draught oxen slaughtered for food. In consequence of the bad food supplies, intestinal diseases were extremely common. Later on, under the protection of the Red Cross flag,[1] supplies came in from British territory, so that each company carried with it a small quantity of medical comforts, such as sago, biscuits, chocolate, cocoa, and condensed milk, burgundy, champagne and brandy. These comforts were carried on the ox wagon.

Much distress was caused by the absence of tents, on account of the severe heat during the day, and by the excessive cold, amounting sometimes to 7° or 8° below freezing point, in the winter months, June to September. Cases of fever, such as enteric fever, had to be sent back on ox wagons to the nearest field hospital or nearest collecting station, ambulance wagons being seldom available. Every possible means were taken to diminish the jolting of the ox wagons. Dr. Ruckert considers the best means of doing this is to apply the Hamburg system of fittings for goods wagons to ox wagons; namely, by slinging the stretchers on ox-hide thongs from the cover of the wagon.

He found the "tabloid" form of drugs in the field extremely useful, but found fault with the packing of the dressing material in large packages and in parchment paper. The paper got torn, and the dressing material became dirty, and often unusable, on account of its being contaminated with fine dust. He considers that the dressing material should be done up in waterproof material hermetically sealed, and in small packages.

His experience as regards the clothing of the men was similar to his experiences of food supplies. Replenishing of clothing was frequently very late in coming, and the men suffered considerably. Especially was this the case in connection with boots, and sometimes the men were obliged to bind pieces of the hides of freshly killed oxen round their feet. The high boots were extremely unsuitable; at one moment they were soaked in water, and at the next they became dry and hard in the sun, the leather contracted, and had to be cut across the instep. Dr. Ruckert advocates, therefore, the use of lace boots only. Often when the men's boots had got wet and had been taken off, it was found impossible to put them on again the next morning, until the leather had been cut along its whole length.

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[1] Why this protection was needed and how it could have helped the author does not say.

Conditions during the march were naturally different from those in fort or camp; the men were then allowed to drink water without boiling or filtering it, so long as there was no possible contamination of the water. Dr. Ruckert himself says that he never found any bad effects from drinking such water without boiling or filtering.

Latrines were not constructed during a few hours stay in any place, but the men were ordered to use a spot some two or three hundred metres to the leeward of the camp, and to cover the excreta with earth.

The condition of the sick during these marches was especially distressing, as they would have to lie all day long on the uneven floor of the springless ox wagons that followed the company. Food supplies were also more deficient than in camp, because there was no time to soften the freshly killed ox flesh. A mincing machine, he says, would have been of priceless value. The company medical and surgical supplies were usually carried on the ox wagon, but as this often came up late, dressing material of all kinds and a light stretcher were carried on a pack animal, the so-called pack donkey, and Dr. Ruckert himself carried in his saddle-bags two small pocket instrument cases, morphia and camphor solutions with hypodermic syringe, and tabloids of cocaine, calomel, morphia, aspirin, salicylate of soda, antipyrin, phenacetin, tannin and opium, bismuth and morphia, Dover's powder, and one or two others. These "tabloids" and the dressing material were sufficient for all requirements, at any rate at first.

Medical officers had often to take command of patrols, and carry out the duties of a combatant officer as well as that of the surgeon. Patrols were usually surprised, and had no knowledge of the presence of Hottentots until they were within 50 or 100 metres of the enemy, when their only hope of escape was in individual flight. Combatant officers and medical officers had the same uniform and equipment, but, says Dr. Ruckert, whenever the Hottentots were certain of their being surgeons, they carried on an active fire against them; "our losses," he says, "amongst the medical *personnel* in the southern district are the best proof of this."[1]

Water tanks were carried on the march, and water had to be used most economically. When the march was across long stretches of waterless country, the men were ordered to leave one water tank untouched until the very last moment. This rule proved often to be of great use, and many a wounded man was able to obtain water when, unexpectedly, the patrol was engaged in an action in a waterless neighbourhood, as, for example, in the seven hours action at Kawigaus, in August, 1905, when the troops were fifty-three hours distant from their water supplies.

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[1] There is no explanation as to why the Hottentots should specially shoot at the medical officers.

An interesting account is given of the manner in which the Medical Service acted during an engagement. Ox wagons, saddle horses and oxen were placed under the nearest cover, and the enemy's position attacked in sections, which on account of the weakness of the companies, consisted of fifteen or twenty men only. A non-commissioned officer of the Medical Service accompanied each section carrying dressing material. The medical officer remained with the officer commanding, who would proceed with his escort to the aid of the section most severely attacked. There was much difficulty in carrying dressing material, because the officers and men of the Medical Service were already loaded with 120 cartridges, cartridge belt, side arm, water bottle, field glass, revolver and rifle. Dr. Ruckert himself carried in his trousers pockets several first dressings, and in an empty cartridge pouch his surgical instrument case and a hypodermic syringe with morphia and camphor solutions. The wounded crept or were carried by comrades to the nearest cover. It was difficult to reach the wounded on account of the distance between the firing lines, there being often a distance of 1 kilometre between sections. Dr. Ruckert appears to have covered the distance by rapid rushes or by creeping along the ground. When there was a large number of casualties the troops remained in their positions until night, when under cover of darkness the wounded were brought back to camp and the enemy's trail followed up the next morning. Serious cases and those requiring operation were eventually evacuated to the nearest field hospital, usually in long, wearisome journeys in an ox wagon. Frequently the enemy's fire was so sudden and unexpected that there was no time to provide medical material and *personnel* to the sections, and then the first field dressing had to be depended upon. Apparently only one package of the new dressing, *i.e.*, a piece of gauze stitched on to a bandage, had been issued; and Dr. Ruckert says this was not so useful as the old dressing with two compresses, since only one of the wounds (entrance or exit) could be covered. This difficulty is now overcome by the issue of two packages of the new first field dressing to each man.

Dr. Ruckert then goes on to detail the unfavourable conditions and difficulties in what was known as the Orange Expedition of October, 1905, an expedition which, he says, called upon each individual to display, to the utmost extent, energy, strength and endurance; qualities which the German soldiers are stated to have displayed in a manner which excited general admiration. After the heavy fighting in the Karrasbergen and on the Fish river, the Hottentots under Morenga were driven south, and with 400 rifles withdrew into the Orange Mountains, believing that it would have been impossible for our troops to follow them. The scouts discovered Morenga on October 13th, with a force of 800 men, near Beenbreek on the Orange River. The Germans attacked him in two columns, but, by the time they reached Beenbreek, Morenga had already withdrawn. The German forces had then to return, on account of want of forage, to Udabis, and there planned another expedition against Morenga, information in regard to the latter being apparently received from British police on the frontier. The column consisted of about 230 men, in addition to followers; the medical *personnel* being 4 medical officers and 7 men of the medical corps. Only the most necessary articles of medical and surgical equipment could be taken, as only 4 mules, one for each company, were available for this purpose. Each mule had a pack saddle carrying 6 packages with dressing material, tabloids and medical comforts. In addition, each mule carried 3 blankets for sick, and 4 poles, 2 to 3 metres long, for improvising stretchers if necessary. In the action that occurred after Hartebeestmund on October 24th and 25th, only the dressing material of the pack animal of one company was available. The other three medical pack animals were killed during the fighting and fell into the hands of the Hottentots. With this small amount of material 34 wounded, with 48 wounds altogether, were dressed for a period of fourteen days. During this expedition the officers had each a mule for riding, but the men went on foot with one pack animal carrying 14 blankets for every 14 men. Food supplies were carried by the men themselves in their packs, and consisted of a small quantity of rice, salt and coffee carried in the mess tin. The expedition started on October 20th. The heat on the following day was excessive, and 15 men were overcome by sunstroke. They were not, however, allowed to remain behind, because that meant certain death, but were taken along with the column. On the 22nd the troops had a similar experience, and had exhausted their supplies of rice and coffee, so that a pack animal had to be slaughtered and a pound of its flesh given to each man. In this condition, and half dead with fatigue and from want of food, the troops appear to have come across the Hottentots on October 24th, and suffered severely, the casualties being 20 killed, including 3 officers, in addition to the 34 wounded already mentioned. Dr. Ruckert was ordered to take charge of the wounded, who were carried partly upon rifles, and partly pick-a-back. The retreat appears to have been full of distressing scenes and horrors, to which was added another attack on the following morning by the Hottentots, who, however, eventually withdrew. It was not until after this attack that the medical officer was able to attend to the wounded, some of them having a dressing applied for the first time then. The condition of the wounded must have been most distressing. The only food available was the flesh of a pack animal roasted without salt, and neither morphia nor hypodermic syringe were available to relieve pain, the only instruments left in Dr. Ruckert's hands being a pair of scissors and forceps. He gives some details of the manner in which splints and stretchers were eventually improvised out of local bushes, pieces of blankets and grass. The journey back with the wounded under these conditions presented a picture which gives reality to Dr. Ruckert's description of the tired columns of stretcher bearers, the rough and ready nature of the material used, the want of food, the heavy sand and uneven ground, excessive heat of the day and the cold of night, with a convoy of wounded suffering amongst other injuries from wounds of the head and fractures of limbs. From his narrative the intention was to march up stream until a suitable spot could be found, where the wounded could be transferred across the Orange river into British territory, and to ask the Catholic Mission at Pella to take them over. Cambreek was reached on October 27th, and the wounded were transferred across the river there. The manner in which this was done is interesting. The river was at this spot about 500 metres wide, not very deep, and there was a number of small islands between the banks. All available troops were ordered to strip naked and stand facing one another in two rows in the water up to their waists. The stretchers were then passed on from hand to hand to the first island, and so on in like manner, from island to island, to the opposite bank. Eventually, towards 4 o'clock in the afternoon, the whole of the wounded had been got over, after the troops had stood for nearly eight hours without a pause in the river.

The British police are said to have been extremely kind and supplied them with bread and coffee. On the morning of the 28th three ox wagons came in from the mission of Pella, and brought much-needed aid to the wounded, who were all brought into Pella in the evening and received with the greatest kindness, being accommodated in the schoolroom of the mission.

Notwithstanding all these hardships, the wounds are said to have healed for the most part favourably, although nearly all suffered from fever during the first few days. Two subsequently died on October 8th. A German surgeon, Dr. Simon, arrived in Pella from Cape Town, with instruments, dressing material, and medical comforts, and from that time onwards more extensive major operations were undertaken. Nearly all the wounded were capable of being moved on December 1st, and were then sent down to the coast to Port Nolloth, which was reached on December 16th. On December 21st the wounded were placed on board a steamer and arrived on December 23rd at Luderitz Bay, where they were transferred to the field hospital there.

Dr. Ruckert's account of his experience is worth reading, as it is a simple and plain tale of the difficulties of dealing with cases of sickness and injury under conditions such as are not contemplated in European warfare, and which cannot well be met except by individual initiative and resource. W. G. M.

**Studies in Mediterranean Fever in the Village of Kléber (Oran) in 1907.**—By Drs. Edmond Sergent and Bories (*Annales de l'Institut Pasteur*, March, 1908). The authors having ascertained by the use of the serum reaction that a number of cases of relapsing fevers in the district of Arzew, which had been classed as typhoid fever, were really cases of Mediterranean fever, proceeded to study the epidemiology of these cases in the village of Kléber. The isolated situation of the village made it specially suitable for the purpose. They found eight persons in the village gave positive serum reactions for Mediterranean fever. Two of these declared that they never took goat's milk, as they did not like it; only one acknowledged to drinking goat's milk unboiled.

The authors examined all the milch goats in the village, 303 in number, and obtained a positive milk reaction in ten of them, or 3·3 per cent. Of the twenty-seven other domestic animals (horses, mules, donkeys) examined, five gave a positive serum reaction.

Two of the persons infected had been engaged on a farm, working among horses and mules, but having nothing to do with the goats, which occupied a separate stable. One of the mules gave a positive serum reaction in 1—20 dilution.

As regards the civil population, on the contrary, the method of life favours all the channels of propagation of the virus. The wretched quarters where Mediterranean fever prevails in Algiers are those whose evil smelling alleys are soiled with urine from end to end. The filthiness of houses and people realizes all the conditions of the experiments on infection by contact which were carried out with monkeys. In the rural locality of Kléber, the necessary contact with infected farm animals, with their harness, with their bedding, constitutes, it must be admitted, an easy means of infection. One may recall the fact that the Malta Fever Commission found that the Macacus monkeys were almost surely infected by the urine of sick monkeys passing over the floor of their cages. The natural infection of the goats themselves does not appear to be brought about by the ingestion of milk during the early months of life, but rather by the contact of the hands in milking, and perhaps by the contact of urine of infected goats or goatherds.

Drs. Sergent and Bories conclude that Mediterranean fever appears to be an enzootic among goats of the Maltese breed, which has spread beyond Malta to Gibraltar, Spain, Italy, North Africa, India and the Transvaal, in the wake of the English, or of Maltese goats. This disease may attack all the domestic animals and man himself. The excretion of the micrococcus by the milk, both of women and goats, or by the urine entails two chief modes of infection—by ingestion of milk, and by the contact of milk or urine—one or the other of these playing the leading part according to circumstances.

**Studies on Mediterranean Fever in 1907.** — By Dr. Edmond Sergent. Dr. Edmond Sergent in the *Annales de l'Institut Pasteur*, March, 1908, summarises his results as follows : " We may conclude from these experiments, taken in connection with the frequency of laboratory infections with *Micrococcus melitensis*, that infection is very easily brought about by simple contact. If we consider, on the other hand, that the amount of infection present among goats in the localities specially studied by us, as Algiers and Argew, is very small, and that a certain number of cases originating in these localities are certainly not due to the ingestion of goats' milk, we are led to the hypothesis that Mediterranean fever is far from originating only in one way. In the military sphere in which the prophylactic conclusions of the Malta Fever Commission have been applied, the substitution of condensed milk for goats' milk has caused the disease to disappear almost completely. But that is because the sphere is a special and isolated one, and because, apart from possible infection through prostitutes, the most important source of infection of the sailors and soldiers through the civil population is by way of foodstuffs."

J. G. McN.

**Studies on Mediterranean Fever in Goats in Algiers in 1907.**— By Drs. Edmond Sergent, V. Gillot, and G. Lemaire (*Annales de l'Institut Pasteur*, March, 1908). The majority of the milch goats in Algiers are of Maltese breed, but some are of Spanish and mixed breeds. Nearly all the goatherds are Maltese, only a few being Spanish. Most of them live in a part of the Faubourg Bab-el-Oued called "la Carrière." The goats are kept shut up in stables, generally low-roofed, ill-ventilated and too small, with badly paved floors which are difficult to keep clean. Their food is spread out in a common manger, to which they are attached on both sides; the goatherds often walk in the manger when crossing the stable. The goats go out each morning about half past four o'clock, and each herd assembles at a place fixed for it by the municipality. They are milked in the street, and the milk is sometimes drunk straight away by the customers. At 7 a.m. the goats return to their stables, which they do not again quit till next morning.

The authors examined samples of milk from all the milch goats yielding milk at Algiers at the time of their investigation. The herds examined totalled 46, containing 609 goats. The milk reaction was positive 26 times, and a micrococcus resembling the *Micrococcus melitensis* in every particular except the property of being agglutinated by a specific serum was isolated from two samples. The 26 positive reactions were found in 11 herds. The authors refer to the fact that it had already been observed in Malta that the infection of the goats was not sporadic, but usually affected several goats in the same herd.

In one herd the serum and milk of the goats were tested simultaneously. Four goats whose milk gave a positive reaction also yielded a serum which reacted; a fifth goat, whose milk did not react, yielded a serum which gave a positive reaction.

Plans of Algiers are given, with the posts occupied by infected goats and the notified cases of Mediterranean fever spotted on them; the great majority of cases of fever occurred in the neighbourhood where infected goats were found. The authors, in comparing their results with those of the Mediterranean Fever Commission at Malta, state that (1) at Malta all the goats are of the Maltese breed, while in Algiers a certain number are of Spanish origin; (2) in Malta there is one milch goat to every ten inhabitants, in Algiers only one to every 159 inhabitants; (3) in Malta the goats are about the streets all day long, in Algiers only for two or three hours in the morning; (4) while in Malta the milk reaction was found positive in 30 per cent. to 50 per cent. of the cases, in Algiers it was only found positive in 4 per cent. J. G. McN.

# Correspondence.

## SLEEPING SICKNESS.[1]

TO THE EDITOR OF THE "TIMES."

SIR,—Questions of priority in scientific discovery are usually of more interest to the individuals concerned than to the general public; nevertheless, I trust that, on the plea of desirability for historical accuracy in connexion with an important disease and discovery, you will find space for this letter.

Those who are familiar with the history of our knowledge of the connexion of the trypanosome with sleeping sickness are probably aware that the disease and parasite were found in association for the first time by myself. Naturally, I claim the discovery. It would seem, however, that certain persons do not regard my claim as valid, or they maintain that, at the most, it is of quite secondary importance to that which they assign to Colonel David Bruce.

Soon after my return from Uganda in 1903 this was made unpleasantly apparent to me, and I daresay that but for Continental opinion and that of a few friends in England, my name would have quickly vanished from the roll of those who have worked more or less successfully to elucidate the mystery of this terrible African disease.

During four years' absence from Europe I have been subjected to a series of misrepresentations on the part of Sir E. Ray Lankester. On my return to England a few days ago, my attention was called to a book entitled "The Kingdom of Man," written by him, in which these misrepresentations are restated and greatly accentuated. I deem the time has come when, in self-respect, I must speak out. In the chapter devoted to sleeping sickness Professor Lankester makes the following statements:—

(1) That, though it was Castellani who first found the trypanosome in sleeping sickness, he gave no importance to it, and when Colonel Bruce arrived in Uganda, Castellani, still having this idea about the trypanosome, simply mentioned the matter to him in a colloquial way.

(2) That Colonel Bruce immediately saw the importance of the observation, and then, as a matter of noteworthy concession, "generously allowed Castellani to take part in the investigation, which resulted in the immediate discovery of the trypanosome in the cerebro-spinal fluid of twenty cases out of thirty-four.

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[1] Printed by permission of the *Times*.

(3) "Castellani returned to Europe three weeks after Bruce's experiments were commenced and announced the discovery, which has been in consequence erroneously attributed to him, although mainly due to Bruce."

To show the incorrectness—to use a mild word—of Sir E. Ray Lankester's statements, I will briefly give the exact history of this matter.

Before Colonel Bruce arrived in Uganda I had examined for trypanosomes fifteen cases of sleeping sickness, and found the parasite in the cerebro-spinal fluid of five and in the blood of two. Before the arrival of Colonel Bruce I acquainted Dr. Moffat and Dr. Baker, of the Uganda Medical Service, with the fact that I had observed a trypanosome in the cerebro-spinal fluid of several cases of sleeping sickness, and made them promise not to divulge it either to the members of the second Commission (Colonel Bruce and Dr. Nabarro), when they should arrive, or to anyone else.

Now, if I had considered the presence of trypanosomes so unimportant, why should I have wished these gentlemen to keep my discovery secret? Moreover, before Colonel Bruce arrived I wrote a letter to Professor Dainelli, of Florence, in which, speaking of the etiology of sleeping sickness, I stated that I was beginning to regret that I had committed myself to the streptococcus theory, and that it had now occurred to me that sleeping sickness might be a trypanosome infection, the streptococcus being only a secondary agent. I added that I wished to go home for a few months, and then try to get back to Uganda again and work on this trypanosome theory. This letter is still in Professor Dainelli's hands.

Colonel Bruce arrived in Uganda on March 16th, 1903. Two days later I acquainted him with my discovery of the presence of trypanosomes in several sleeping sickness patients. And how did I acquaint him? According to Sir E. Ray Lankester I simply mentioned the observation without giving it any importance. This is absolutely incorrect. I acquainted Colonel Bruce in this way: I wrote him a note asking him to be so good as to come to my bungalow, as I thought it was my duty, as a member of the first Sleeping Sickness Commission, to acquaint him with some observations I was sure would interest him greatly, seeing that they opened up a new line of investigation. He kindly came. As conditions to my acquainting him with the new line of investigation I asked:—

(1) That I should remain a few weeks longer in Uganda to continue my observations in this line.

(2) That my work till my departure from Uganda should be independent and my own, and that he and Mrs. Bruce should control my findings.

(3) That at the end of my stay in Uganda I should write a note and that this note should bear my name, and my name alone.

If the idea of a possible relation between trypanosomes and sleeping sickness had not occurred to my mind, and if I had considered the trypanosome as unimportant, as Sir E. Ray Lankester would have people believe, why should I have made these conditions?

Colonel Bruce acquiesced to all of them and gave me his word of honour not to break them. On receiving this promise, I then acquainted him with my discovery of trypanosomes in several cases of sleeping sickness. Colonel Bruce was, of course, very much interested, but he said that as the Uganda natives are full of all sorts of parasites, the trypanosome might easily be a harmless parasite like *F. perstans*.

Work was at once started, and the same day I performed a lumbar puncture on the patient Kapori, and there and then I showed Colonel Bruce the trypanosome in the cerebro-spinal fluid of this boy. All went well for two days, during which time Colonel Bruce learnt from me the technique necessary for finding the trypanosome in the cerebro-spinal fluid. On the third day his manner towards me changed. As I was far from looking well, he advised me, in a somewhat abrupt manner, to go home, *and gave me the advice to stick to the streptococcus theory.* I answered that I wished to remain a little longer and to make some additional observations as agreed. He finally consented to this, and we got on again on very good terms, so much so that when, on April 5, 1903, I brought him a rough draft of my note, he very kindly corrected the English of it. Moreover, he gave me a letter to the Secretary of the Royal Society, in which he recommended the publication of this note. How, then, I would ask, can Sir E. Ray Lankester offensively hint that I acted dishonestly in publishing my discovery?

In this note I described the special technique to be used, and in a table I gave particulars of the thirty-four cases of sleeping sickness I had examined up to date for the presence of the trypanosome, which I had found in twenty of them. I stated, as a conclusion, that I thought the disease to be probably due to the trypanosome, and that the streptococcus was probably a secondary infection. Colonel Bruce did not take exception to any part of the note; he only advised me not to come to any conclusion as regards the etiological significance of the trypanosome. This advice I did not take. On my voyage home I sent from Port Said, on April 26th, a registered letter to the secretary of the Royal Society, stating that, influenced by my latest investigations, I considered the trypanosome to be the probable cause of the disease.

On my way to London I stopped, on May 3rd, for a day in Bonn, and acquainted more completely Professor Kruse, my old teacher and friend, with my results and conclusions. The same day he mentioned these to Professor Finkler and others, and soon after he made a communication on the subject to the Medical Society of Bonn. (See *Sitzungsberichte der Niederrhein Gesellsch. f. Natur. u. Heilkunde zu Bonn*, May, 1903.)

As regards my original note, it was published in the *Proceedings of the Royal Society* in May, 1903. This is a very different story from that given by Sir E. Ray Lankester; it is the true one, nevertheless.

With all due respect to Sir E. Ray Lankester, the public must not take him seriously when he plays historian of medicine. It is not very accurate for a zoölogist, a protozoologist, and a medical historian to state, as he did in a book published in 1903, that Bruce discovered the nagana trypanosome before Evans found the surra trypanosome. Every medical student knows that Evans's reports were published many years before those of Bruce. As regards the investigation of sleeping sickness, he simply ignores everyone else except Bruce; the names of all those who directly or indirectly had some part in the elucidation of the disease, such as Forde, Dutton, Todd, Nabarro, Baker, Low, Manson, Sambon, Brumpt, &c., are absent or hardly mentioned; the part I took is minimised and misrepresented. In his eagerness to champion Bruce, Sir E. Ray Lankester states that Bruce found the trypanosome in twenty patients out of thirty-four. In this way Sir E. Ray Lankester gives Bruce credit for having investigated some of my patients who had been dead months before Bruce arrived in Uganda. Anyone who has the patience to go through Reports I. and II. of the Sleeping Sickness Commission of the Royal Society, can easily see through this piece of unjustifiable special pleading.

If Sir E. Ray Lankester's statements are often inaccurate when he discusses questions of protozoology, they are not much better when he tackles helminthology. It is somewhat strange to hear from a director of the most important Natural History Museum in the world that the adult form of *Filaria sanguinis hominis* (being a zoologist he might more correctly call it *F. bancrofti*) is one-fifteenth of an inch in length (!), and that the development of the embryos of the same filaria in the mosquito is simply a suggestion "no proof of which has ever been made."

If Professor Lankester had taken the trouble to leave his professorial armchair for a moment to consult any of the recent works on parasitology on his shelves, he could have ascertained that the "adult" form of *F. bancrofti* measures from three to four inches in length, and that its development has been thoroughly worked out from the time it enters the mosquito as a microscopic larva a hundredth of an inch in length, till it creeps out of the proboscis of the same insect an object visible to the naked eye.

I could point out many other gross inaccuracies in Sir E. Ray Lankester's "Kingdom of Man," as well as in several of his other works. I merely mention these as they occur in juxtaposition to those he has made with regard to myself. They serve to show that the Professor is not to be regarded as a trustworthy guide, either in medical zoology or in medical history.

I see that Professor Lankester has not repeated in his "Kingdom of

Man" the error about the date of the discovery of *T. evansi.* This capacity for practical repentance, although it is not accompanied by acknowledgment of sin, leads me to hope that, in some future work, he may correct the gross errors I have referred to, and, possibly, that he may yet see fit to judge more favourably of me and my work.

I am, Sir, your obedient servant,

*Norfolk Hotel, Harrington Road, S.W.* ALDO CASTELLANI.

*June*, 1908.

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TO THE EDITOR OF THE "TIMES."

SIR,—As an interested spectator, and to some extent a participator, in the investigation of sleeping sickness in Uganda in 1903, I feel qualified to make a few comments on Dr. Castellani's letter of this morning in justice to Sir David Bruce, against whom this letter is partly directed.

Early in March, 1903, I found a trypanosome in the blood of a patient suffering from fever, but having no symptoms suggestive of sleeping sickness at that time. I showed this to Dr. Castellani, who, having bound me to secrecy, told me he had found a similar parasite in a patient suffering from sleeping sickness in November, 1902, and I have no reason to doubt this statement. He at the same time said that as he had found the parasite in a very few cases only, he still considered his previously discovered streptococcus to be the true cause. My finding trypanosomes in two other cases (published *British Medical Journal*, May 30th, 1903) apparently made him attach a greater importance to the parasite than hitherto, for in the few days before Colonel Bruce arrived he displayed much energy in a further search for trypanosomes in the cerebro-spinal fluid of his patients. Then I learnt to my surprise that he had himself informed Colonel Bruce of his discovery without letting me know, so that as I thought his conduct peculiar, and as I felt then at liberty to do so, I gave Colonel Bruce as much information as I could.

Dr. Castellani had previously expressed his intention of leaving Entebbe before Colonel Bruce's arrival, so that it is difficult to understand his statement that he persuaded Colonel Bruce to allow him to remain on; in fact, I firmly believe that it was Colonel Bruce who persuaded him to stop, and helped him in the investigation of further cases so that he might obtain sufficient data for a full report. Up to the time he left Entebbe he still maintained that his streptococcus theory was the true one, and if it had not been for the timely occurrence of my three cases, and the fact that they urged him to collect more evidence of the existence of the trypanosome, he would have gone home saying nothing about it. Though he can claim the credit of being the first to discover the trypanosome in a patient with concomitant symptoms of sleeping sickness (it had been previously found by Ford in West Africa, though without the symptoms of sleeping sickness), it is obvious that the whole task of proving the parasite to be the cause of the disease as well as its connexion with the tsetse-fly was carried out by Bruce and Nabarro, as may be seen in the Royal Society's Reports.

It seems extraordinary that the writer in his attempt to acquire kudos should make it publicly known that (1) he at one time intended to conceal important data from his Colleagues on the Commission, which might have tied their hands for months. (2) That he made communications to members of foreign Universities which surely should have been the property of the Royal Society, of whose Commission he had the honour to be a member.

I am, Sir, your obedient servant,
C. J. BAKER,
*Medical Officer, Uganda.*

*Care of the Crown Agents for the Colonies,*
*Whitehall, S.W., July 8th.*

TO THE EDITOR OF THE "TIMES."

SIR,—The Castellani-Bruce incident was closed four and a half years ago—before Dr. Castellani went to Ceylon. The *Times* of the latter part of November, 1903, contains several letters on the subject. The matter also came before the Committee of the Royal Society on Tropical Diseases, of which I was the Chairman. This fact accounts for my having anything to say on the case.

The statement which I have made in books and articles as to the parts played by Dr. Castellani and Colonel Bruce has not varied, but it is in accordance with the finding of that Committee. Dr. Castellani has always been given the credit due to him for having observed the presence of a trypanosoma in some cases of sleeping sickness. His present assertion that I have stated in my book "The Kingdom of Man" that he communicated this to Colonel Bruce "colloquially," is contrary to fact, as anyone may see who refers to the book. It was Dr. Castellani's absolute duty, on relinquishing his work in Uganda, to communicate to Colonel Bruce any observations which he had made and had not followed up, in order that the purpose for which both Castellani and Bruce had been sent to Uganda—viz., the discovery of the cause of sleeping sickness —should be accomplished. Dr. Castellani now tells us that he went about binding his fellow-investigators to secrecy, and dictating terms to the officer in charge of the investigations before he consented to reveal the fact that he had (some months before) seen a trypanosoma. He had not, we know, investigated the hypothesis that the trypanosoma was the cause of sleeping sickness, and his work was terminated. He had arranged to leave Uganda; and had he carried out his expressed intention of doing so before Colonel Bruce arrived, the trypanosoma would undoubtedly have been detected without delay by that officer alone. The investigation and confirmation of the hypothesis that the trypanosoma is the cause of sleeping sickness would have been carried out precisely as it was—namely, by Colonel Bruce—and the preliminary paper which Bruce wrote and kindly gave to Castellani to take home and publish as his (Castellani's) would have been printed with Bruce's name as author instead of Castellani's. Dr. Castellani has been blamed (I think rightly) for not sufficiently acknowledging his indebtedness to Colonel Bruce, an omission which has led to a misconception as to his share in the discovery. The account which he has just given us of his melodramatic attempts to secure secrecy and to strike a bargain with his official superior in the public inquiry which he was employed to promote will probably assist your readers in forming a correct opinion as to Dr. Castellani's merits in this matter.

With regard to the claim put forward by Sir Patrick Manson's friends to the effect that he has shown that a mosquito is the agent by which the *Filaria sanguinis hominis* (discovered and so named by Dr. Timothy Lewis) is introduced into the human body, I have only to say that on several occasions I have had to point out that Sir Patrick Manson has not shown this to be the case, nor has anyone else done so. I have not done Sir Patrick the injustice of supposing that he has authorized or suggested the erroneous pretension in question.

May I say in conclusion that the communication published by you on July 8th, over Dr. Castellani's name, appears to be part of a campaign, now of some duration, carried on in regard to the claims to the origination of important discoveries, usually associated with the names of distinguished and honoured investigators, such as Major Ross and Colonel Bruce, by individuals who appear to hope that in this way they may gain increased consideration and support for the London School of Tropical Medicine? These unauthorized efforts must do more harm than good to that institution. So far as I am concerned, I have no interests at stake in this rivalry, and wish that each and all of the schools and laboratories engaged in the study of tropical disease may continue to add to our knowledge of the causes of those scourges.

At the same time, I believe it to be a duty to testify as to matters within my personal and special experience affecting the correct estimate of claims, to the honour of having rendered public service by scientific discovery.

I am, Sir, yours faithfully,
E. Ray Lankester.

29, *Thurloe Place, S.W.*,
*July* 10*th*.

## THE TREATMENT OF SCABIES BY BALSAM OF PERU.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—My experience is quite different from that of Lieutenant Aviss. Since January last I have treated sixteen cases of scabies by this method and have had no complications or relapses. Each case was under treatment for twenty-four hours and then sent to duty, being afterwards kept under observation for a month. One thing is necessary, and that is a strict observance of detail, and until one has trained a thoroughly reliable orderly it is better to supervise the treatment oneself. The temperature of the preliminary bath is very important, also the length of time the patient is kept in it. I sometimes find the patient about to be put into a bath barely tepid. I can only imagine that the difficulties experienced by Lieutenant Aviss are due to want of strict observance of details. I personally have found this method of treatment most satisfactory.

I am, &c.,
J. B. Buchanan.
*Lieutenant-Colonel, R.A.M.C.*

*Londonderry,*
*July* 10*th*, 1908.

## OBITUARY NOTICE OF SURGEON-GENERAL SIR JAMES HANBURY, K.C.B.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—In the obituary notice of Surgeon-General Sir James Hanbury, K.C.B., it was stated that he "was the son of Mr. Samuel Hanbury, a stockbroker in the City of London, and his mother was Frances, daughter of the Rev. W. Sewell, of Headley, Surrey." This is not correct. Sir James was an Irishman. His father was Samuel Hanbury, Esq., of Somerstown House, Laracor, Co. Meath, and his mother was Louisa, daughter of the Rev. Charles Ingham, Rector of Kilmesson, Co. Meath. Sir James was a remarkable man, and as he was an Irishman and a Meath man I think the country and county should have the credit of his origin. I am his nephew.

I am, &c.,
S. Smartt
(*Vicar of Newry*).

*The Vicarage, Newry,*
*June 29th,* 1908.

## THE TREATMENT OF SYPHILIS BY INTRAMUSCULAR INJECTIONS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—The attack on Colonel Lambkin in the July number of the Journal with reference to the above subject is much to be regretted. I think it will generally be admitted (at any rate by those of us who have several years' service) that the continuous out-patient treatment of soldiers who are suffering from syphilis is mainly due to the introduction of the method of intramuscular injections by *Colonel Lambkin.* The Army and the civil population owe him a very deep debt of gratitude.

The treatment by inunction, and also by the mouth, has been well known for a very long time, but these methods are quite inadmissible in Army out-patient practice.

If we had not been taught by Lambkin the advantages of intramuscular injections, I do not think it would have been possible to have issued Army Order 158, of 1903, an order which has resulted in a large number of men leaving the Army cured, which has enormously reduced the amount of invaliding from syphilis, and which must have greatly diminished the spread of the disease amongst the civil population. The number of cases of salivation which attend the use of insoluble preparations are (in proportion to the vast number of injections which are annually given) very small, and can most probably be traced to some carelessness in the method of administration. There is very little doubt that probably owing to over-heating of the grey oil, aided by insufficient stirring of the mixture during dispensing, a large proportion of the metallic mercury may find its way into the lower layers in the bottle. In this way the recipients of the upper part get a smaller dose than is intended, with the probable result that they develop symptoms which one does not expect to see after eight or ten 1 grain injections, and in the latter case salivation occurs after a few injections.

In spite, however, of the very slight risk of such accidents, and of the opinions of the civil surgeons quoted by Major French, the number of Army surgeons who use it to the exclusion of all other methods is vastly in excess of those who treat the disease by inunction or by the mouth. I hope that what Major French has written, coming as it does from a specialist and a teacher of young officers who are posted to one of our largest hospitals, will not have the effect of deterring our younger brethren from the use of intramuscular injections, and, as inunctions are obviously impossible in out-patient military practice (which point is conceded by Major French), induce them to fall back on pills and powder, which in the great majority of cases will never be taken.

As regards the loss of weight under mercurial injections, our experience at this hospital has not been the same as Major French's. I have looked up my records during the past three years that I have been responsible for the treatment of syphilis at this station, the disease having been treated solely by injections of Lambkin's cream.

The total number of new cases (to end of May, 1908) has been 246, and as no treatment is ever given before the appearance of the initial rash, they are all genuine. Out of this number, 220 men gained an average of 2 to 4 lbs. by the end of their fourth injection.

9 men were up to their original weight at the end of the 10th injection.
14 ,, ,, ,, ,, ,, 8th ,,
5 ,, ,, ,, ,, ,, 9th ,,
4 ,, ,, ,, ,, ,, 5th ,,
8 men left the station under weight.

The following figures may prove interesting :—

| | 1903 | 1904 | 1905 | 1906 | 1907 | 1908 to end of May |
|---|---|---|---|---|---|---|
| Average strength of garrison .. | 3,300 | 3,178 | 3,252 | 3,573 | 3,154 | 3,409 |
| Number of cases treated in hospital | 198 | 147 | 129 | 156 | 119 | 62 |
| Average constantly sick in hospital | 22·04 | 17·61 | 11·35 | 12·93 | 7·62 | 6·17 |
| Number of cases placed on Syphilis Register | .. | .. | 139 | 168 | 76 | 15 |

The above shows the reduction in the number of men who require to be readmitted for recurrent symptoms, and also the greatly reduced period for which they require to be kept in hospital.

As regards the statement by Messrs. Gibbs and Ward, I can only say that severe relapses are practically never seen at this hospital; that I have not had a single case of syphilitic iritis to treat in the last three years, and our experience here has been that men hardly ever show any further signs of the disease after the completion of the third course of injections. By this time they have had twelve 1 grain and ten ½ grain doses, spread over a period of forty-two weeks. The treatment is most popular with the men, and the comparative emptiness of the twenty-four-bedded ward which is appropriated to the treatment of venereal sores and syphilis is a constant source of surprise to those who know the strength of the garrison, and the average of about seventy weekly out-patients.

I am, &c.,

*Colchester*, F. J. W. PORTER,

*July 14th*, 1908. *Major*, *R.A.M.C.*

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# Journal
# of the
# Royal Army Medical Corps.

## Original Communications.

### MIAN MIR (LAHORE CANTONMENT): A RETROSPECT AND PROSPECT.

BY LIEUTENANT-COLONEL H. D. ROWAN.
*Royal Army Medical Corps.*

IN July, 1906, the Government of India sanctioned the designation of the cantonment of Mian Mir being changed to Lahore Cantonment. The proximity of Mian Mir to Lahore suggested the desirability of identifying the cantonment with the capital of the Punjab. There was the less hesitation in changing the name inasmuch as during nearly the whole period of its existence Mian Mir had been one of the unhealthiest stations in India; the name had become associated with sickness and ill-health, and had acquired the opprobrious epithet of the "white man's grave."

It has fallen to my lot to spend the last three years in Mian Mir, not under ordinary circumstances an enviable lot; but it has been my good fortune to have been associated with the cantonment when it not only changed its name but changed its character. Before the old name is wholly lost in oblivion I propose giving a short description of the cantonment, what it was, and what it is, and trust that it may interest my brother officers to learn something of the vicissitudes of a cantonment which has been occupied by our countrymen for over sixty years.

#### A.

The cantonment of Mian Mir is some five miles from Lahore; the name was appropriate enough, but the selection of the site has been severely criticised.

*The Name.*—Mian Mir was a famous Pir; he was a contemporary of Nanak, the first Sikh Guru, and the spiritual adviser of Dara Shikoh, eldest son of Shahjehan (1658), and if one may judge of the tenets of the master by those of his disciple, Mian Mir was a singularly liberal-minded Mussulman. His tomb is within a mile of Mian Mir cantonment, hence the name.

*The Selection of the Site.*—Bosworth Smith, in his "Life of Lord Lawrence," is responsible for the following story, which he states he had from an eye-witness: "After the annexation of the Punjab, among other matters calling for immediate attention was the selection of a site for a cantonment near Lahore, but there had been some difficulty in getting a decisive reply from Sir Charles Napier, who was, at the time, Commander-in-Chief. One morning the members of the Board of Administration of the Punjab (the brothers Lawrence and Mansel), accompanied by Mr. Montgomery, were out for an early morning ride when they saw, in the distance, Napier with his Staff. 'Let us see,' they said, 'whether we can get an answer from the General about the new cantonment.'

"'You want to know where the new cantonment will be?' asked Napier. 'Very well, follow me'; and away went the General and his Staff, helter-skelter across country, the Board of Administration, who were indifferently mounted, keeping up as best they could. Some four or five miles were covered in this undignified manner, when suddenly the Chief pulled up at a marshy and pestilential spot and said: 'We'll have the cantonment here.'" The story is an old and oft-repeated one, but it is not altogether a correct representation of the facts. In the first place, Sir Charles Napier was pre-eminently the soldier's friend; few commanders-in-chief have taken the personal interest he did in all that concerned the soldier's welfare. Some of the best barracks in India were designed by him, and again and again he wrote advocating amelioration of the soldier's lot by giving him a good barrack, good food and clothing, and by providing him with means of recreation and amusement. One therefore hesitates to believe a story that implies that Sir Charles Napier was in the habit of acting without forethought, or that he would, in a fit of petulance, sacrifice the comfort and lives of his soldiers and fellow-countrymen. Again, Sir W. McMurdo, who was the Chief's aide-de-camp, says that he, at that time, invariably accompanied the Chief on his rides abroad, and that he has no recollection of this incident; further, he says he was present when the Chief examined the site for the new cantonment, and believes that it was on that occasion that he decided to occupy it. That the selection of the site was not so informal as Bosworth Smith's story would have us believe is also proved by the fact that a Committee, of which Mr. Stewart (Deputy Inspector-General of Hospitals) was a member, was convened to report upon it. Neither could the site have been "a marshy and pestilential spot." No one can doubt, who has ever been to Mian Mir, that before the advent of the canal the site must have been an absolute desert.

*Was the Site an Unhealthy One?*—Mian Mir is a sandy plain about 700 feet above sea level. So far as its climate is concerned it is a trifle hotter and has rather less rain than most parts of the Punjab.

Our recent views of the causation of disease have rather discounted the value of soil as an etiological factor, but mention may be made here of the "Khunkur," which is a peculiarity of Mian Mir. Some 4 feet below the surface is a substratum of clay and sand, intermixed with which is a large amount of "Khunkur," an insoluble carbonate of lime. This substratum is about 3 feet thick, and so impervious is it that it resists the penetrative power of the roots of trees. There are practically no trees indigenous to Mian Mir, except, perhaps, the "tamarisk" and "khikar." This broad belt of "Khunkur" not only accounts for the naturally barren aspect of the place, but, as will be seen later, makes for unhealthiness by favouring stagnation of surface water, and, where there are cesspits, leading to the contamination of wells. On the whole, the natural conditions of Mian Mir do not appear to be able to account for its notorious unhealthiness.

In the fifties and early sixties Mian Mir is frequently described as "ordinarily a very healthy station." Sir Charles Napier says: "It is a healthy spot: good water is found 20 feet under the surface, and the air is pure." McMurdo describes it as "a dry, comparatively high ground, without vegetation, but with a canal close by." He revisited it in 1873, when he writes: "I did not know the place again; it was all so crowded by extended vegetation which ought never to have been permitted." Major-General C. A. Windham, General Officer Commanding Lahore Division in 1860, attributes the healthiness of the neighbouring population to the dry climate and almost entire freedom from malaria, and states that commanding officers and medical officers consider that the health of the troops improves on coming to this station.

If the natural conditions of the cantonment can be absolved from blame, the same cannot be said of those which were, or should have been, foreign to the locality; these include the absence of surface drainage, the use of cesspits, overcrowding, and the introduction of the canal; to these must be attributed that persistent unhealthiness which has been so characteristic of this ill-reputed station.

*The Barracks.*—A general idea of Mian Mir can be obtained from the plan on p. 238. It is a long straggling cantonment, laid out on a much larger scale than has ever been found to be necessary. The strength of the garrison has usually been about 1,200 European and 2,000 to 2,500 native troops. At either end of the station are the barracks of the British infantry and artillery, and between are the lines of the native regiments.

The site having been decided upon, building operations were begun at once, and in the same year (1850) Mr. Stewart (Deputy Inspector-General of Hospitals) saw one barrack nearly completed, of which he remarks: "It was the only really good barrack I had seen in India." The barracks were planned by Sir Charles Napier, and in point of general arrangement, accommodation, lighting, &c., were a long way in advance of any barracks at the time; they are still in occupation and no serious objection can be taken to them. Apropos of the barracks it is interesting to note what Miss Nightingale thought of the Family Hospital, which was built at the same time. She describes it as "a nest of rooms within rooms," and adds that what was said by one of our engineers of the Pasha's new fort in the Dardanelles might be said of it: "He would be much safer outside of it"—a perfectly fair criticism so long as it was proposed to occupy both centre rooms and inner verandahs. At present this building makes a suitable enteric or infectious hospital.

If the barracks were satisfactory, the same cannot be said of the "accessories." There were no drains about the barracks, a grave defect where you have an impervious soil and a scarcely perceptible gradient. The water from the wash-houses found its way into cesspits, which were from 30 to 40 feet deep and only 60 feet from the barracks and 180 feet from wells. They sometimes overflowed, saturating the ground and tainting the air. A sanitary report of 1860 states: "They were occasionally opened and emptied"! These cesspits being well below the "Khunkur" level must surely have contaminated the water supply, which was exclusively from wells. There were also cesspits in connection with the latrines, but of these I have not been able to find any particulars. Lastly, it was not long before the barracks became overcrowded.

The new barracks were occupied in 1852, and the following table gives one an idea of the amount of sickness that used to prevail in those good old days. A senior medical officer of the present day could hardly contemplate such figures with any degree of satisfaction, and yet at this time Mian Mir was, as I have said, a comparatively healthy station. These figures compared very favourably, for example, with those of Peshawar or Ferozpore, and with the exception of one year (1856) the death-rate was less than one-half of that amongst British troops throughout India.

BRITISH INFANTRY—MIAN MIR.

| Year | Regiment | Constantly sick | Admission | Deaths (per 1,000) |
|---|---|---|---|---|
| 1852 | 96th Foot | 112 | 4,513 | 72 |
| 1853 | ,, | 74 | 2,340 | 50 |
| 1854 | 10th Foot | 94 | 1,801 | 30 |
| 1855 | ,,<br>81st Foot<br>Det. | 74 | 1,470 | 20 |
| 1856 | 81st Foot | 112 | 3,107 | 175 |
| 1856 | Det. | | | |

The high admission-rate of the 96th Foot was doubtless due very largely to ill-health contracted in their old barracks in Lahore. The high mortality of 1856 was due to cholera. In that year, out of a total of 1,576 British soldiers in Mian Mir, there were 501 cases of cholera, with 273 deaths.

Here I wish to make a digression. We are often reminded of the giants of former days, and invidious comparisons are made with the so-called weaklings of to-day; but what have statistics to say on the subject? Between 1800 and 1856 the mortality amongst European soldiers of the Honourable East India Company's Service was 69 per 1,000, or 60 per 1,000 higher than that of men of the same age in England; or, to put it in another way, "a company out of every regiment has been sacrificed every twenty months." It was at this expense that we held dominion in India for half a century. No; the soldier of a hundred years ago, grand fellow though he was, was no more immune to sickness than the youngster of to-day; he should have been, and he might have been, exempt had more care been taken of him and had his life been more temperate. Intemperance alone contributed in some stations as much as one-sixth of the total admissions. Two drams of spirit, or one-eighth of a quart, was the allowance *per diem* for each man on payment. Enormous were the profits made on this sale of spirit. Any balance in the canteen fund of over 3,000 rupees lapsed to Government, so, in order to dispose of the surplus, racquet courts, fives courts, swimming baths, theatres, &c., were built all over India, many of them standing memorials to this day, not of the generosity of the Indian Government, but of the dram-drinking habits of our misguided countrymen.

To return to Mian Mir. Shortly after the Mutiny and for forty years the ill-favour of Mian Mir grew apace. Very soon it acquired the reputation of being one of the unhealthiest stations in India, and again and again we find it surpassing all other stations in the number of admissions to hospital and in the number constantly sick. The diseases mainly responsible for this state of things were cholera and fever.

*Cholera.*—The outbreak of 1856 has already been referred to. In 1861 cholera appeared with such appalling severity that years after we are told that no regiments go to Mian Mir without the dread that they may be the victims of a pestilence similar to that which is associated in their minds with the occurrences of 1861 in this ill-reputed station. In August, 1861, there were 2,452 Europeans—men, women, and children—in Mian Mir; in the course of six weeks nearly 900 of them were attacked by cholera, and more than 500 died. To add to the horrors of such a visitation the hospital accommodation was totally inadequate to meet even the ordinary requirements, and no attempt was made to provide extra accommodation. Hospital orderlies to attend on the sick were furnished from the British soldiers, and it is stated that of the 51st Regiment alone 863 men were employed on this duty. "Crowded to excess with the ordinary sick, the cholera patients, and their attendants, it is not to be wondered at that the hospital became a charnel-house, and that from dread of admission men neglected to report their illness during that period when efforts to combat the disease are of most avail." Towards the end of the epidemic the hospital was vacated, the patients transferred to barracks and native soldiers were employed in attendance on the British sick. Between 1862 and 1867 there was only one case of cholera; in 1867 there were 86 cases and 52 deaths, the strength of the garrison being about 1,000. In 1872 there were 123 deaths from cholera. On this occasion it was found necessary to vacate all the barracks and move every European into camp before the epidemic ceased. In 1881 there was a sharp epidemic, since when there has been no serious outbreak of cholera in Mian Mir. The record of 1899 is noteworthy, as in that year there was only one case of cholera amongst the British troops throughout India, and this case occurred in Mian Mir!

Cholera in Mian Mir has almost invariably been an importation from Lahore, and the presence of the cesspits already referred to and the contamination of the wells are sufficient to account for the widespread character of the epidemics. Drinking water from our present waterworks was available in 1873, since when all the drinking water of British troops has been filtered and subsequently boiled.

*Fevers.*—Under this heading I include ague, remittent fever, and simple continued fever. The classification may not be scientific, but it is comprehensive and practical. By including cases returned as simple continued fever with those of malaria, you make sure of getting all the cases of malaria; exclude simple continued fever and you will find that, hitherto, at any rate, the amount of malaria depends not altogether upon the prevalence of anopheles, but also upon the methods of diagnosis and the personal prejudices of medical officers.

Fevers are not so fatal as cholera, but they cause far more inefficiency. It has been the persistent and widespread prevalence of "fever" more than anything else that has given Mian Mir its infamous reputation. The comparative healthiness of Mian Mir when first occupied has been referred to, and for ten years after the Mutiny the health of the station compared very well with that of other stations so far as "fever" was concerned. For example, between 1860-9 the admission-rate for "fevers" in Mian Mir was 800 per 1,000, that for the whole of the Punjab being 741 per 1,000. The corresponding figures for the next two years are very different, thus: 1870-9—Mian Mir, 1,692; Punjab, 969. The prevalence of "fever" in Mian Mir dates from 1867, and it is in this year that we hear of a channel being made to carry water from Bari Doab Canal into cantonment.

Chart I. shows the prevalence of "fever" for a period of fifty years. The chart is divided into three sections: before, during, and after irrigation; there can be no doubt that the presence of the canal has had a most unfavourable influence on the health of this station. At the foot of the chart is recorded in figures the admission-rate for "fever" of Ambala, Rawalpindi, and Peshawar. A comparison of these figures with that of Mian Mir shows (1) that during the period of irrigation "fevers" were more prevalent in Mian Mir than in any one of these stations; (2) that since the diversion of the canal fever has diminished in prevalence in Mian Mir to a much greater extent than in Ambala, Peshawar, or Pindi.

In 1879 Mian Mir surpassed itself, and established several records. The admission-rate for "fevers" was 3,427 per 1,000.

If we allow that the fever season covered a period of six months, the above figures mean that on an average every man was admitted into hospital with fever seven times. The admission-rate for all causes in 1879 was 4,740 per 1,000. Again, the number constantly sick was 140 per 1,000.

Truly these are remarkable records for a cantonment that had been occupied for upwards of a quarter of a century. If we had done nothing else for Mian Mir we had, indeed, developed to their fullest extent the epidemic agencies of the place.

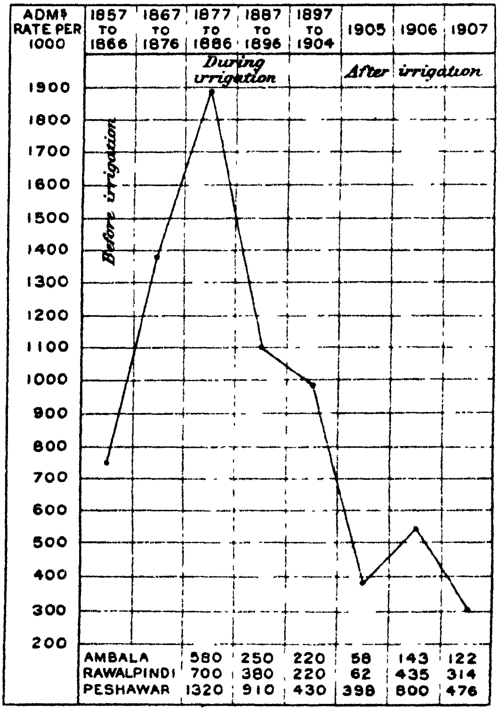


CHART I.

And so for fifty years Mian Mir continued to be a hopelessly fever-stricken station, and this in spite of every effort to ameliorate the lot of the soldier by improving his barracks, his food, his clothing, and general surroundings. Even one year's residence in Mian Mir was sufficient to render regiments inefficient, so much so that when the time came for their relief it often occurred that not a single company was fit to march, the whole regiment having to be trained to their destination. As late as 1904 Surgeon-General Hamilton (Principal Medical Officer, Lahore Division) wrote: "No figures, no description, could give any idea of the state of the garrison of Mian Mir last November or December. The hospitals were full of cases of malaria of the worst type, and it required no trained eye to see that four-fifths of the men that one met on the roads should have been in hospital." In short, the state of things in Mian Mir had come to be intolerable. Every effort to combat its unhealthiness had failed; it was almost decided to abandon the station for British troops when one last effort was made, this time in the direction of anti-malarial operations.

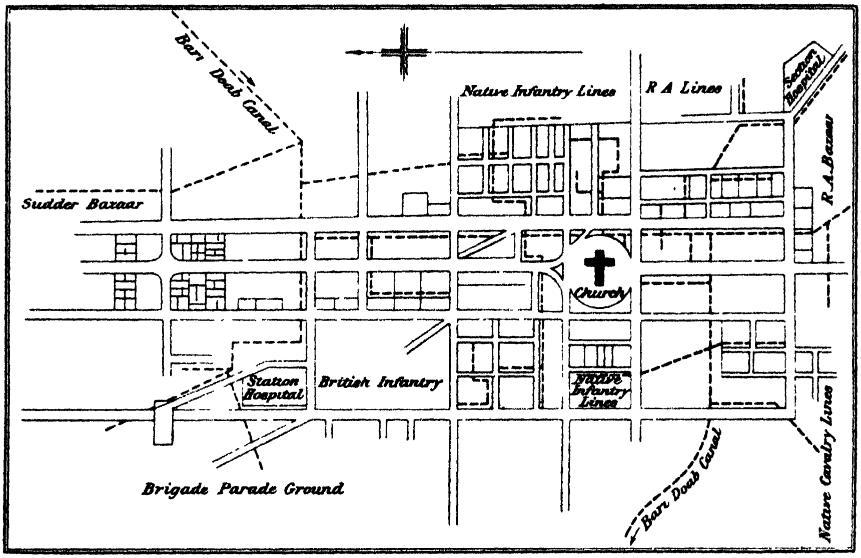
In 1901 and 1902 James and Christopher had carried out anti-malarial operations in the Royal Artillery lines, and their efforts were directed chiefly to the destruction of mosquitoes and the obliteration of their breeding-places. Immediate results were aimed at, but their funds did not admit of attempting the permanent removal of widespread insanitary conditions. The admission-rate for malaria fell from 1,400 in 1901 to 300 in 1902, but as it rose again in 1903 to 1,100 the results of the operations may be said to be negative.

In 1904 a more ambitious programme was set forth. Fortunately, the General Officer Commanding the Lahore Division (Lieutenant-General W. Kitchener, C.B.) was a keen advocate of anti-malarial measures, and the campaign was successfully organised by Lieutenant-Colonel (now Colonel) O'Sullivan, R.A.M.C., who was Senior Medical Officer at the time. The most urgent indication was the complete diversion of the canal. The following plan shows the general course of the canal through the cantonment; its smaller tributaries, not shown on the plan, practically irrigated every compound in the station. The total area irrigated in cantonment was about 1,200 acres.

The case against the canal was, shortly, that when the canal was flowing the irrigation was excessive, fields and gardens were water-logged, and when the water was cut off stagnant pools were left in the course of the "kutcha" drains and under the culverts. As irrigation was discontinued about once in six weeks, for a fortnight or more at a time, these pools became ideal breeding-places of anopheles. The diversion of the canal was begun in 1904; by April, 1905, all canal irrigation within cantonment boundaries was stopped except in the case of leased lands, where it was continued until July. There can be no doubt that the closing of the canal was of immense benefit to the community of

Mian Mir. Reliable statistics of the bazaar population are unfortunately not available, but the returns of the British and native troops show not only a marked diminution in the admission-rate for fevers, but a decided improvement in their general health.

At the same time the whole cantonment was divided into six areas, to each of which an assistant surgeon or hospital assistant was appointed, who acted under the orders of the medical officer of the area. A working party of twelve men of the Army Bearer Corps visited each area one day in the week. In each area the following anti-malarial measures were carried out: (1) Clearing of surface drains. (2) Removal of undergrowth. (3) Levelling the ground. This was done so thoroughly that, with the exception of one huge "borrow" pit, which is gradually being filled in, there was not a hollow or depression throughout the cantonment where surface water could lie for more than three to four days after the heaviest rainfall. (4) Oiling of wells. Wells and their immediate surroundings were, I believe, the chief remaining source of malaria in this station. To render them less harmful they were protected by wooden covers, and all irrigation wells were oiled once or twice weekly, in the evening, from May to November. (5) Administration of quinine; this also has been very thoroughly carried out



*Course of the Canal* ----- *Scale 1in. = about 1942 yards* during the past three years. All troops (British and native) and their families, and all followers, were given quinine on two successive days weekly. In the case of native children, they were bribed with sweetmeats to take their weekly dose of quinine. Chart II. shows the effect of these measures upon the general health of the British troops.

Ten years ago the admission-rate used to hover about 2,000 per 1,000 of strength ; last year it was 650 per 1,000.

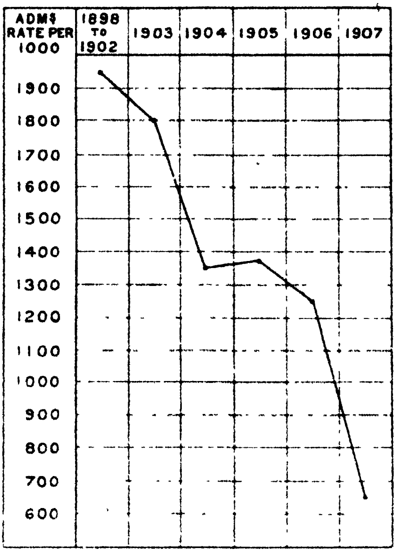


Chart II.

The enormous diminution of mosquitoes of all kinds has sensibly relieved one of the burdens of the white man, and (I give the fact for what it is worth) sand-flies, which three years ago made life scarcely endurable, were last year almost extinct.

*What has been the Cost of these Operations ?*—The diversion of the canal entailed a loss of revenue to the cantonment fund of about Rs.6,000 yearly, and the actual filling in of the canal cuttings and the digging of wells to replace them, together with some minor sanitary improvements, cost about Rs.15,000. Since 1905 the cantonment fund has granted annually Rs.1,000 for anti-malarial work. On the whole, therefore, I think it will be generally admitted that, compared with the value of the result achieved, the cost has been wholly insignificant.

Such is the story of malaria in Mian Mir, and it serves as an object lesson of the value of what is implied by the term Preventive Medicine.

With the same soil, the same climate, the same barracks, and the same class of population, the admission-rate for "fevers," which twenty odd years ago was nearly 1,900 (average for five consecutive years), has fallen to less than 500 (average for the last three years), and in 1907 reached the gratifying record of only 200 per 1,000.

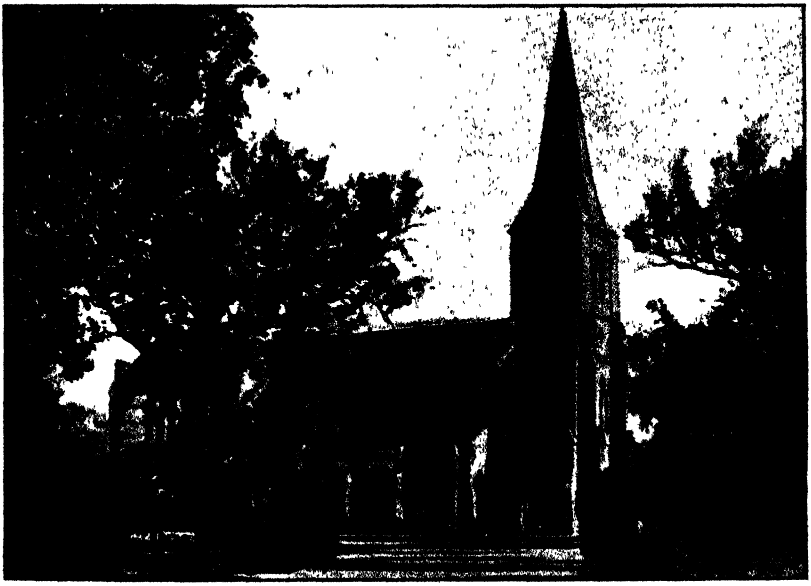
## B.

*The Mutiny.*—News of the mutiny at Meerut reached Lahore on May 12th, 1857. After a hurried conference it was decided to disarm the native regiments at Mian Mir. Mr. Robert Montgomery was the Acting Commissioner at Lahore. Brigadier-General Corbett was commanding the troops at Mian Mir, and Colonel Renny was commanding the 81st Regiment.

The garrison of Mian Mir at the time consisted of the 81st Regiment, two troops of Horse Artillery, the 8th Native Cavalry, and the 6th, 16th and 41st Native Infantry. A parade was ordered for the 13th, but the decision of the authorities was kept a profound secret. A ball, given in the Royal Artillery Mess by the Station to the officers of the 81st Regiment, was allowed to go on, and one can understand how those who took part in it thought it very inconsiderate of the authorities to have a brigade parade the morning after a dance. On the morning of the 13th the troops were drawn up on the brigade parade-ground, the Royal Artillery and 81st Regiment on the right, the native cavalry on the left, and the native infantry regiments in the centre. After the inspection a series of movements were gone through which the Sepoys would think were part of the ordinary brigade manœuvres, until, facing the rear, they found themselves confronted with the Artillery and British infantry; the subdivisions of the 81st fell back between the guns, then came the order, "81st load"; the clang of the ramrods was heard, and the gunners were seen standing with their port-firers in hand. The Sepoys were ordered to pile arms; there was a momentary hesitation, then they sullenly obeyed. The arms and ammunition were conveyed to Fort Lahore, where the native detachment had already been disarmed by three companies of the 81st Regiment. So ended the Mutiny so far as Mian Mir and Lahore were concerned, and one cannot but admire the promptness and decision with which the whole affair was carried through and the boldness of it, for on that eventful parade there were only 250 Europeans, while the Sepoys numbered 2,000.

On June 8th there was another brigade parade; on this occasion two Sepoys of the 35th Native Infantry, who had been found guilty of an attempt to mutiny, were blown from the guns. The prisoners had been tried by a drum-head court-martial composed of native officers.

On July 30th the 26th Native Infantry mutinied at Mian Mir, and, murdering their commanding officer (Major Spencer), a European non-commissioned officer, and two native officers, fled; they escaped during a heavy dust-storm, but were overtaken and destroyed on the banks of the Rair, a few miles from the cantonment.



## C.

An account of Mian Mir would be very incomplete without mention of the church, perhaps the most beautiful garrison church India possesses. The foundation stone of St. Mary Magdalen's was laid in 1854, in the presence of Brigadier-General H. Lawrence, Mr. Robert Montgomery, C.S., and Mr. D. F. MacLeod, C.S., and was consecrated in 1857 by the Bishop of Madras. The church is designed in the early English style, the workmanship throughout is of first-rate excellence and beautifully finished. The interior from floor to roof has the appearance of being inlaid with white marble. This effect has been obtained by a costly mortar made from marble got from old buildings in Lahore; this is polished exceedingly smooth, is of a pure white, and pointed in imitation of stone. The floor of the chancel and the centre of the aisles are of alternate blocks of white marble and a dark agate-like-looking stone, both highly polished. The font, the steps to the chancel and to the altar, are of white marble. All the windows are filled with stained glass. The actual cost of the church is unknown, but it is believed to have cost Rs.90,000, of which Rs.43,000 were paid by the Indian Government. The church was designed and built by Captain J. N. Sharp, Bengal Engineers, who died of cholera only a few months before the completion of his work. In the church is a tablet to his memory, but, as the inscription tells us, the church itself stands a lasting monument to his good taste, skill, and piety.

# AN INTRODUCTION TO METHODS OF STUDYING THE MORBID HISTOLOGY OF DISEASE-CARRYING INSECTS.

By Captain A. E. HAMERTON, D.S.O.
*Royal Army Medical Corps.*

The great technical improvements in modern histological research have simplified the investigation of the stages of development, and have enabled us to follow out the life-history of some of the pathogenic protozoa which are dependent upon an invertebrate host for the fulfilment of their biological destiny. Much remains to be discovered in this comparatively new field of medical and veterinary research, and there are some of us who have opportunities for pursuing such investigations in the well-equipped laboratories which are nowadays provided in most large military stations abroad. It is proposed, by way of an introduction to methods of studying the morbid histology of arthropoda, to briefly outline some broad principles of the technique required.

*Fixing.*—The fixing of the tissue elements is of primary importance for all classes of objects, whether it be desired to cut them into sections or to treat them in any other special way. The term "fixing" implies not only the rapid killing of the element, so that it may not have time to change the form it had during life, but also the hardening of it to such a degree as to enable it to retain its original shape and size when submitted to the action of the reagents with which it may subsequently be treated. It follows, therefore, that the parts of blood-sucking insects required for histology should be immersed in the fixing fluid immediately the insects are killed. A strip of the chitinous wall of the abdomen, of the thorax, and of the head, if a large fly, should first be snipped off, or the parts to be examined may be dissected out in the fixative, in order to permit of rapid fixing and hardening of the cells of the internal organs.

A useful fixing fluid for this purpose is picro-acetic acid, as suggested in The Journal of the Royal Army Medical Corps for July, 1908. Viscera of insects or pieces of tissue several millimetres in thickness require one to six hours immersion, according to size. The insect and its dissected parts should then be transferred to 60 per cent. alcohol, in which they may be kept indefinitely until it is convenient to embed them. Picric acid should always be washed out with alcohol. The extraction is more rapid with warm alcohol to which a little lithium carbonate has been added. Where it is possible to proceed at once to embedding the material, it is better to treat the object with one of the following solutions :—

(1) Saturated solution of corrosive sublimate to which 2 per cent. of glacial acetic acid has been added ;

or better :—

| | |
|---|---|
| (2) Absolute alcohol | 1 vol. |
| Glacial acetic acid | 1 ,, |
| Chloroform | 1 ,, |
| Corrosive sublimate | to saturation. |

Objects should be removed from the fixing bath and washed in 70 per cent. alcohol as soon as they appear to have become opaque throughout ; the time required varies from a few seconds for the salivary gland of a fly to a few minutes for larger objects.

Another excellent fixative for all purposes is Flemming's solution, which can be obtained from Grübler ready made up, or may be prepared as follows :—

| | |
|---|---|
| Chromic acid, 1 per cent. | 15 vols. |
| Osmic acid, 2 per cent. | 4 ,, |
| Glacial acetic acid | 1 ,, |

Flemming's fluid may be allowed to act for from one to many hours or days. Some workers state that objects may be left in this fluid for several weeks or months without detriment. After fixing in Flemming's solution, it is necessary to wash the solution out of the object very thoroughly by leaving it for several hours in running water.

*Dehydrating.*—The tissue having been fixed and washed, it is now necessary to dehydrate it. This should be done by passing through strengths of alcohol in consecutive order, commencing with a 10 per cent. solution and increasing 10 per cent. until finally a bath of absolute alcohol is reached. For small objects a minute or two in each alcohol bath suffices. They should, however, be left in the absolute alcohol bath for some hours in order to harden.

*Embedding.*—Put into a test tube sufficient cedar-wood oil to cover the object, then gently pour a little absolute alcohol into the tube, so as to have a thin layer of alcohol floating upon the top of the cedar-wood oil. Take the already dehydrated piece of tissue, and put carefully on to the layer of alcohol in the tube, and leave it until it has sunk to the bottom of the cedar-wood oil. Let the object remain in the oil for, say, half an hour, then transfer it rapidly into paraffin kept at melting point in a watch-glass. The melting point of the paraffin should be the lowest possible in the climate. A paraffin melting at 50° C. if the temperature of the laboratory is between 15° C. and 17° C. is a useful standard; for higher temperatures use a harder paraffin, and for low temperatures paraffin with a low melting point is required. After about half an hour it is advisable to transfer the object into another watch-glass containing fresh clean paraffin. Minute pieces of tissues like the viscera of insects should be left in the paraffin bath for one to three hours according to size. When the object is thoroughly soaked, a paraffin block should be prepared as follows: Take a clean Petrie dish, pour into it enough glycerine to form a thin layer on the bottom and heat slightly in the spirit-flame. Now pour over the layer of glycerine a thin layer of the melted paraffin. When the layer of paraffin is just about to solidify pour over it quickly the remainder of the paraffin containing the pieces of tissue and quickly separate and arrange the pieces of tissue with a hot needle. The Petrie dish should now be floated in cold water to produce rapid solidification of the paraffin. On immersing the Petrie dish in the water, the cake of paraffin will float up out of the dish. Blocks of paraffin with the pieces of tissue embedded therein can then be cut out of the cake, trimmed as required, and mounted on the object-carrier of the microtome.

The preparation of sections of such chitinous structures as the hard proboscis of *Stomoxys* or the mouth parts of other biting insects requires special consideration. Chitinous structures may be fixed in either picro-acetic acid or, better still, in either of the corrosive sublimate solutions given above. After washing out the fixative the chitin should be softened by boiling gently for about an hour in a 10 per cent. solution of caustic potash. The alkali should then be thoroughly washed out in running water and the object dehydrated and embedded as described above.

In studying the anatomy of the mouth parts of biting insects by the method of cutting serial sections it is necessary to endeavour to preserve the integrity of these brittle structures and to keep the component parts of the piercing organs in their natural position. In order to obtain this difficult ideal the following method, though tedious, gives good results: Take four small test tubes. In tube I. make a saturated solution of gum acacia in ether. In tube II. make a thick syrupy solution of celloidin in ether. Now mix the contents of tubes I. and II. in equal quantities. This makes the stock solution in tube III. When proceeding to cut sections take another tube, IV., and put into it 2 cc. of ether and a few drops of absolute alcohol. Then with a camel-hair brush moistened in water take a drop or two of the stock solution from tube III. and mix it well with the contents of tube IV. With the mixture so obtained paint the surface of the paraffin block after each cutting of a section. The ether evaporates, leaving over the object to be cut a thin film of adhesive protective material. When sections so treated have been mounted and fixed on the slide the celloidin must be dissolved off by washing the slide over with ether before passing it into xylol. For details of another method of dealing with chitinous structures by immersing in increasing strengths of celloidin solution before embedding, I would refer the reader to Stephens and Christopher's book, "The Practical Study of Malaria" (third edition).

*Cutting.*—When cutting thin sections (8 to 10 $\mu$) the following points must be attended to in order to avoid crumpling and rolling: First and foremost the paraffin must not be too hard. If, after cutting, the paraffin is found to be too hard, it may be softened by placing near the embedded object a couple of Bunsen or spirit lamp flames, so arranged as to ensure equal warming of the two sides of the block. If the paraffin is too soft the block may be cooled by a lump of ice or alcohol spray. Secondly, the knife should be set square and the block trimmed to a four-sided prism. If ribbons are to be cut the block must be oriented, with one of its sides parallel to the knife edge and the opposite side parallel to this one. Ribbons of sections will often cut perfectly flat, even when the same mass will only give rolled and crumpled sections when cut disconnectedly.

*Mounting.*—The following method of mounting minute sections is convenient.

Make up Meyer's albumen solution as follows:—

| | |
|---|---|
| White of new-laid egg | 25 cc. |
| Pure glycerine | 25 cc. |
| Sodium salicylate | 0·5 gramme |

For use put about two drops of this solution into a watch-glass full of water and mix. Now transfer a few drops of this albumen solution from the watch-glass on to a slide by means of a camel-hair brush. Using the brush again, take up a short ribbon of sections and float it, shiny surface downwards, upon the fluid on the slide. Drain off the excess of albumen solution, and arrange the ribbon in a straight line and let it dry thoroughly on the slide, leaving it overnight if possible, remembering to protect it from dust. When the sections are dried on the slide, the latter should be gently warmed until the paraffin is just melting. The slide should now be flushed with xylol to remove the excess of paraffin, and then immersed in xylol for a few minutes. The next step is to put the slide for a few minutes into 90 per cent. alcohol to remove the xylol. Now pass the slide rapidly through alcohol baths from 80 per cent. to 70, 60, 50, 40, 30, 20, and 10 per cent., finally flushing the slide with distilled water. Unstained sections so fixed on the slide can now be transferred for staining to any aqueous stain which may be selected.

*Staining.*—Tissues like the organs of mosquitoes, bugs or flies, which have been fixed in picro-acetic acid, may, after removal of the acid by washing in alcohol, be stained in bulk by transferring them from the alcohol to Grenacher's alcoholic borax carmine stain, as sold ready made up by Grübler or prepared according to the following formula:—

Make a concentrated solution of carmine in borax solution (3 per cent. carmine to 4 per cent. borax solution in water) by boiling for half an hour; dilute it with an equal volume of 90 per cent. alcohol, allow it to stand for a time, and then filter and keep for a week to ripen. Preparations should remain in this stain until thoroughly penetrated, that is, for about half an hour in the case of delicate insect tissues, or several hours for coarser tissues. From the stain they should be transferred direct to 70 per cent. alcohol, which has been acidulated with four drops of hydrochloric acid to each 100 cc. of alcohol solution. They are left in the acid alcohol for a few minutes to allow of differentiation, and are then passed into absolute alcohol and cedar-wood oil, when they may be embedded in the usual way.

Tissues may also be stained in bulk in Delafield's hæmatoxylin. This stain gives good results when applied to unstained sections mounted on the slide. Delafield's hæmatoxylin can be obtained ready made up from Grübler and Co., Leipzig, or it may be prepared as follows: To 400 cc. of saturated solution of ammonia-alum (ammonia-alum dissolves in about eleven parts of water) add 4 grammes of hæmatoxylin crystals dissolved in 25 cc. of strong alcohol. Leave it exposed to the light and air in an unstoppered bottle for three to four days, filter, and add 100 cc. of glycerine and 100 cc. of methylic alcohol. Allow the solution to stand until the colour is sufficiently dark, then filter and keep in a tightly stoppered bottle. This solution stains best when a few months old; it will keep for years. It is a powerful stain and must be diluted before use with equal parts of distilled water, to which one drop of glacial acetic acid has been added. As the stain is in aqueous solution, objects must not be transferred directly into it from strong alcohol; they must first be passed through the grades of diminishing strengths of alcohol as given previously.

Tissues in bulk may be stained overnight in this solution. Tissues in section should be examined at intervals under the low power of the microscope to guard against over-staining. About three hours immersion in the stain is usually sufficient.

For accurate work in cytology and histology staining is most satisfactorily done after cutting and fixing the sections on to the slide. It is advisable to prepare half a dozen or more slides of the tissue to be examined, and to stain by several different methods. An aqueous solution of Leishman's stains gives good results with some tissues. I would refer the reader to the *British Medical Journal* of June 20, 1908, for a good method of fixing and staining by the Giemsa stain.

It is generally admitted that the most reliable of all known stains is iron-hæmatoxylin applied according to Heidenhain's method. This is a very powerful stain of a certain optical quality peculiarly suited to the employment of high powers. It will take effect on any material, is absolutely permanent, and it permits of the use of a large variety of counter-stains.

As this is a standard stain, the technique of its application will be given in detail. The sections having been fixed on the slides as above described and the paraffin washed out with xylol, the slides are resting in 90 per cent. alcohol. It is now necessary to transfer the specimens into 80 per cent. alcohol, containing iodine and potassium iodide in the following proportions :—

Make up a concentrated solution of potassium iodide in water, and of iodine in alcohol. Mix them together, and add to the mixture some 80 per cent. alcohol until the mixture becomes a dark brown colour. Leave the slides in this solution for five to ten minutes, and then pass them into 30 per cent. alcohol, and through decreasing strengths of alcohol to distilled water.

The specimens should now be immersed for about an hour in the following solution of iron-alum (eisenoxydammon, Grübler), 3 per cent. dissolved in distilled water. The slides are then washed with water and stained in an aqueous solution of hæmatoxylin prepared as follows: Hæmatoxylin (pure), ½ per cent., dissolved in distilled water to which a few drops of concentrated solution of lithium carbonate may be added by way of improving the stain. This solution keeps indefinitely and improves with age. The sections should be left in the hæmatoxylin for half an hour to two hours. They are then washed with water and again treated with iron-alum solution, which slowly washes out the stain. The progress of the differentiation ought to be controlled by frequent microscopic examination under the low power, the sections being removed from time to time out of the iron-alum, rinsed with water and examined. When a proper differentiation has been obtained, *i.e.*, the nuclei appearing black and other parts of the cell fairly clear or smoky, the preparations should be washed for at least a quarter of an hour in running tap-water.

In order to make a pretty preparation with a good contrast of colour, it is advisable to counter-stain in one of the following solutions: Saffranin O (Grübler), 1 gramme dissolved in 10 cc. of absolute alcohol and added to 90 cc. of aniline oil water. After differentiation and washing in tap-water, the preparations may be transferred directly into this stain, and left therein until the tissue has become sufficiently coloured. They must then be rapidly dehydrated with alcohol, cleared in xylol and mounted. Orange G (Grübler), a little of the stain is put into 80 per cent. alcohol to form a saturated solution. The slides should be passed through increasing strengths of alcohols to the 80 per cent. solution containing the stain. They may be left in the latter for about ten minutes. Eosin or acid fuchsin prepared in the same way may be used as counter-stains.

For further information I would refer the reader to the two books named in the footnote.[1]

The preparation of microscopic specimens, like the preparation of photographs, admits of considerable modification and improvement according to the experience and fancy of the worker. Every microtomist having once mastered the theoretical and practical rudiments of his craft, will soon know how to select fixatives and stains suitable to his material. Although we cannot all expect to unfold great truths which would point out the way for the advance of practical preventative medicine, we cannot fail to derive interest and pleasure from contemplating the exceeding beauty and wonderful complexity of such minute organs as the proventriculus of a fly or the sucking apparatus of a mosquito.

In conclusion, I desire to express my thanks to Professor E. A. Minchin, M.A., F.Z.S., of London University, for his great kindness in demonstrating to me many of the methods described above.

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[1] "The Microtomist's Vade-mecum," Lee, Sixth Edition; and "Practical Study of Malaria," Third Edition, Christopher and Stephens.

# A RECENT METHOD FOR THE DIRECT DETERMINATION OF WATER IN FOODS, &c.

BY MAJOR W. W. O. BEVERIDGE, D.S.O.
*Royal Army Medical Corps.*

IN 1906, C. Aschman and J. P. Arend (*Chem. Zeit.*, 1906, 30, 953) described a new method for determining the water present in butter and other fats by distillation with xylene. It depends upon the fact that water present in the substance, on distillation, comes over with the xylene, and when condensed the quantity can be directly measured. They found that for quantities of water from 1 to 5 grammes, the results obtained were always from 0·07 to 0·11 per cent. lower than those obtained by the gravimetric process.

The method is carried out as follows: 20 to 25 grammes of the fat to be examined and 75 cc. of xylene are introduced into a flask of about 300 cc. capacity. The flask is connected to a vertical condenser by means of a glass delivery tube of about 7 mm. bore, narrowed at one end. The end of the delivery tube is in connection with a special funnel-mouthed receiver, which consists of a graduated tube, having a stop-cock at the lower end and holding 5 cc. divided into $\frac{1}{20}$ cc. This is filled with mercury.

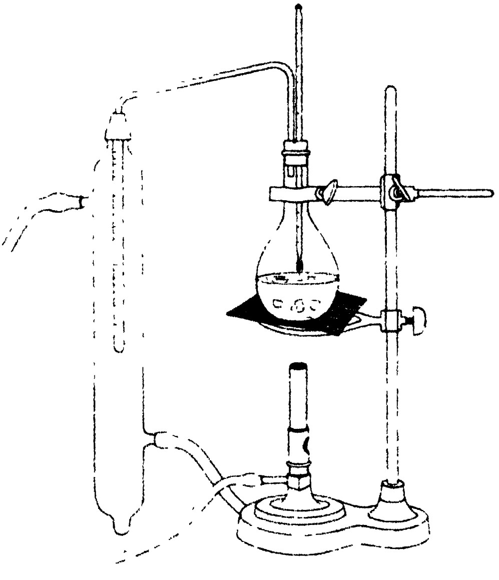
The distillation is conducted gently at first, until most of the water has passed over with the xylene and then the heating is increased to ensure vigorous ebullition. The whole process of distillation should be completed in from twenty to twenty-five minutes. In order that all the water may collect clear below the xylene, the mixture of water and xylene which has condensed is allowed to stand for some hours, before the amount is read off.

This year W. Thörner has published (*Zeit. angew. Chem.*, 1908, 21) a similar process, applicable to the direct estimation of water in various kinds of foods, &c., such as meats, butter, soap, cocoa, sausages and inorganic salts. From the results of many estimations he finds that the figures agree very closely with those obtained gravimetrically.

The method is based upon the same principles as the one already given, but has the advantage of being less costly and is more easily worked. In this case ordinary petroleum takes the place of the xylene; 50 cc. of ordinary petroleum, a few pieces of pumice stone, and from 10 to 25 grammes of the substance are introduced into a round-bottomed flask of about 300 cc. capacity.

The flask is fitted with a thermometer, and is connected to a condenser, connected in turn to a vertical graduated cylinder. The contents of the flask are then distilled, and when about 18 cc. of petroleum have passed over, all the water contained in the substance will have come over with it and will lie eventually below the oil in the graduated tube; after allowing sufficient time for settling, the amount can be directly read off. In the case of certain liquids which are liable to frothing, this may be prevented by the addition of a little dry tannin to the distillation flask.

The above method has been tried in the Hygiene Research Laboratory at the Royal Army Medical College, and has been found on the whole to give good results. The advantages over the ordinary gravimetric method are, that there is no loss due to volatile matter, the estimation is easily carried out with simple apparatus procurable in any well-found laboratory, and the process is completed at the most in a few hours, whereas by the ordinary gravimetric method twenty-four hours, as a rule, are necessary.



The following table gives a few of the results we have obtained by this method. These have been compared with those obtained by the gravimetric method, *i.e.*, by drying in a water oven, followed by a final drying in the desiccator before weighing, both processes being conducted at the same time. In each case it will be observed that the amount of water estimated by the petroleum method is a little higher than that obtained by the gravimetric method, the results showing an average of about 0·08 per cent. more.

| Nature of sample | Water estimated per cent., gravimetric method | Water estimated per cent., petroleum method |
|---|---|---|
| Corned mutton .. .. .. .. | 47·58 | 47·60 |
| Pork pie (tinned) .. .. .. .. | 29·94 | 30·00 |
| Pork sausages (fresh) .. .. .. | 36·52 | 36·60 |
| Oxford sausages (tinned) .. .. .. | 40·53 | 40·70 |
| Emergency ration, 1899— | | |
| Concentrated beef .. .. .. | 5·29 | 5·30 |
| Cocoa paste .. .. .. .. | 11·43 | 11·60 |

We have found that the above apparatus fulfils all that is necessary.

A round-bottomed flask of 300 cc. is fitted with a thermometer and connected by means of a glass tube of about 7 mm. bore to an ordinary glass condenser, placed in an upright position, with the lower end closed and the inner tube removed. The delivery tube reaches well into the end of a graduated gas tube of 25 cc., which is fixed by means of an india-rubber connection vertically within the condenser, so as to be surrounded by a water jacket.

The procedure is carried out as recommended by W. Thörner, care being taken that all drops of water which may have settled in the delivery tube are carried over into the measuring tube.

In the case of meats, cocoa and sausages, 10 grammes of the substance have been found to be a convenient quantity for examination.

# STAFF TOURS.

(*Continued.*)

BY MAJOR F. J. WADE-BROWN.

*Royal Army Medical Corps.*

ON June 2nd and following days, I had the pleasure of attending a Staff Tour carried out by the Officers of the Senior Division of the Staff College, Camberley. By the kindness of the Commandant, Brigadier-General H. H. Wilson, D.S.O., I am permitted to publish the "general" and "special" ideas and also one of the "narratives"; I regret their taking up so much space in the Journal, but unless published *in extenso* they are apt to be valueless.

The theatre of operations was intended to represent that of the 1859 campaign, in the valley of the River Po, between Austria on the one side and France allied with Sardinia (Lombardy) on the other. An account of this campaign will be found in "L'Histoire abrégée des Campagnes modernes," by Colonel J. Vial, vol. ii.

## SENIOR DIVISION, 1908.

### STAFF TOUR, JUNE 2ND TO 5TH.

*Reference : ¼ inch and ½ inch Ordnance Survey Maps.*

### GENERAL IDEA (SEE MAP).

(1) Four countries are concerned in the operations about to take place :—

(*a*) NORTHLAND, *i.e.*, all that part of England lying north of a line joining the mouths of the Rivers Mersey and Humber.

(*b*) EASTLAND, *i.e.*, all that part of England lying south of a line joining the mouths of the Rivers Mersey and Humber, and east of the Counties of Cheshire, Staffordshire, Warwickshire and Oxfordshire, the River Thames from Reading to the sea being the southern frontier.

(*c*) BLUELAND, *i.e.*, all Wales plus the Counties of Cheshire, Shropshire, Staffordshire, Herefordshire, Worcestershire, Warwickshire, Oxfordshire and Gloucestershire, the southern frontier being the River Avon from its mouth below Bristol, the Avon and Kennet Canal, and the River Kennet to its junction with the River Thames at Reading.

(*d*) REDLAND, *i.e.*, all that part of England lying south of the Bristol Avon, the Avon and Kennet Canal, the River Kennet and the River Thames.

(2) REDLAND has often attempted to conquer and absorb BLUELAND, but the assistance which NORTHLAND has extended to BLUELAND has

always prevented REDLAND from succeeding. EASTLAND has invariably been, and is, a neutral.

(3) During the present year NORTHLAND and BLUELAND have made an alliance with a view to crushing REDLAND and putting an end to the constant state of menace on BLUELAND's southern frontier.

(4) During the month of May all three powers mobilized, and REDLAND, coming to the conclusion that it was impossible to avert a war any longer, sent BLUELAND a peremptory order to demobilise by June 1st, failing which she threatened to move into BLUELAND.

(5) No answer having been received by 12 midnight on June 1st to 2nd, the REDLAND columns moved across the frontier.

(6) The following information is common property to all three countries:—

(*a*) The REDLAND army is about 100,000 strong, and is standing ready to move across the River Avon. This army is likely to be reinforced by another 30,000 to 40,000 men in the next two or three weeks.

(*b*) The BLUELAND regular forces amount to between 60,000 and 70,000 of all arms, about one-third being on the left bank of the River Severn, covering Bridgnorth about Worcester; the remainder being on the right bank of the River Severn, in the triangle Brecon-Cardiff-Gloucester, some light troops being in observation of the southern frontier. Bridgnorth is not only the capital of BLUELAND, but it is also its greatest manufacturing town, its most important arsenal, and its seat of government.

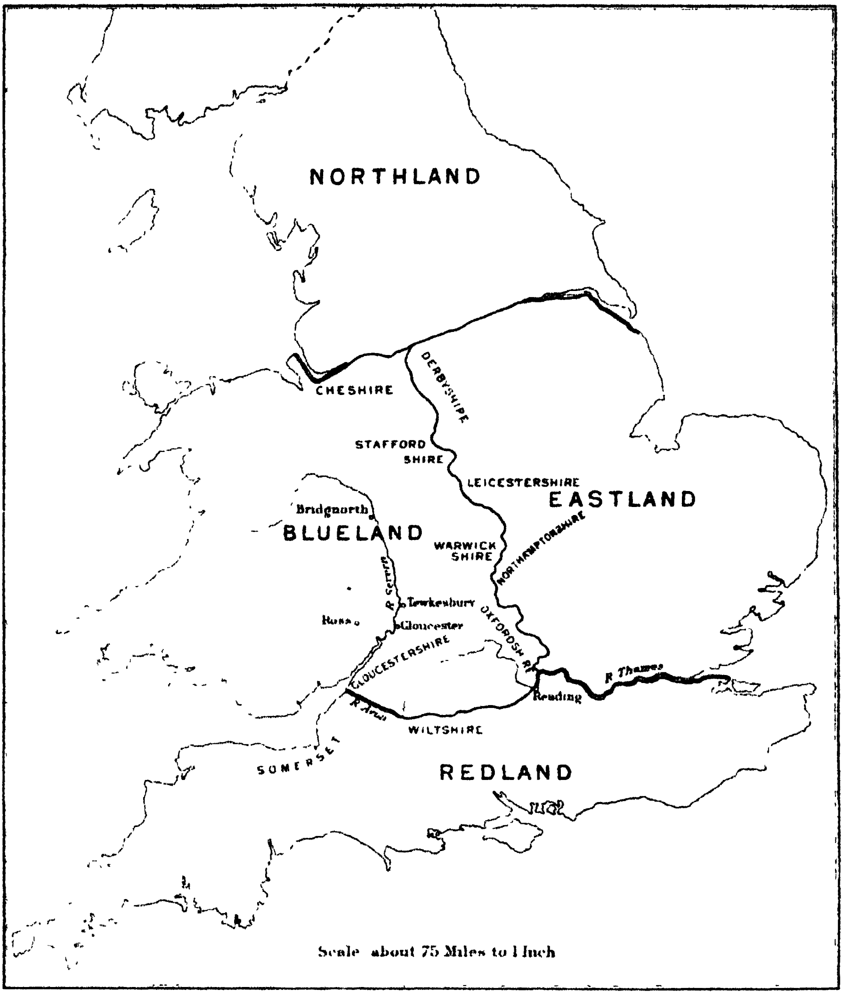
(*c*) The NORTHLAND army, about 200,000 strong, is destined to co-operate with BLUELAND by advancing both from the NORTHLAND frontier on Bridgnorth and from Milford Haven (the only possible landing-place on the west coast) *viâ* Brecon. Owing to the physical difficulties of these lines of advance, and the time necessary for disembarkation, the NORTHLAND troops are not expected to exercise an important influence on the operations before June 8th.

(*d*) Plans for field fortifications to be erected along the Worcester-Birmingham Canal have been prepared. Ross and Tewkesbury are protected by semi-permanent fortifications, those at the latter place embracing both sides of the River Severn. Some old field works stand opposite Gloucester on the right bank of the River Severn, but these are not of a serious nature against modern artillery. The Severn Tunnel does not exist. The only bridges over the Severn are those now standing at Gloucester, Tewkesbury, Worcester, Stourport, and Bridgnorth.

(*e*) The BLUELAND troops, for various reasons, are inferior in all respects both to those of the enemy and to their own allies.

(*f*) The railways and telegraphs are available as they would be in a theatre of war.

(*g*) The inhabitants of BLUELAND are not all loyal to that country. Those on the left bank of the River Severn, from the Worcester-Birmingham Canal down to Bristol, are friendly to REDLAND.



## SENIOR DIVISION, 1908.

### Staff Tour, June 2nd to 5th.

*Reference ¼ inch and ½ inch Ordnance Survey Maps.*

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### Redland. Special Idea.

(1) The Commander-in-Chief, Redland, has been fully aware for some days that war would break out any moment, and the Emperor of Redland has continually impressed on him the fact that it is of great importance that the Blueland army should be destroyed before the Northland reinforcements can reach their allies, and also that the capital should be captured before the arrival of large northern reinforcements would

render such an operation impossible. A brief extract of the Emperor's last letter, written from the REDLAND capital on May 29th, and received by the Commander-in-Chief at Bath on June 1st, will perhaps make the state of affairs clearer.

After referring to previous dispatches received from the Commander-in-Chief, in which the latter had clearly stated the particular difficulties of operating by the left bank of the Severn, or the right bank, or astride of that river, and after fully admitting the difficulties imposed by each course, the Emperor went on to say: "You are given a free hand in the coming operations, but I would again impress on you the importance of crushing the BLUELAND field forces before they can be reinforced by the NORTHLAND troops. All my information here leads me to the belief that the greater portion of the reinforcements will reach the lower Severn Valley by Milford Haven and the Brecon. On the other hand, you are to bear in mind that a large number of the inhabitants of the left bank of the Severn are friendly to my cause. The BLUELAND troops are of inferior quality. The immensely important capital of Bridgnorth and its stores and manufactories are therefore peculiarly susceptible to your attack, and its capture and occupation would have a marked effect on the course of the coming campaign."

(2) No further information regarding the enemy or his intentions has reached the Commander-in-Chief, REDLAND, than that already contained in the "General Idea."

(3) The REDLAND reinforcements mentioned in the "General Idea" will reach the present frontier about Bath as follows:—

Two Divisions by train on June 18th.

Two Divisions by route march on June 25th.

(4) The positions of the REDLAND troops are as shown in the accompanying Table A.

(5) It may be assumed that all troops are in camp or billets, and ready to move on receipt of orders, which, however, cannot be issued from Army Headquarters until 12 midnight on June 1st to 2nd.

### *Establishments.*

Strengths are as laid down in War Establishments, 1907-8.

### TABLE A. REDLAND FORCE.

*Distribution*[1] *on the afternoon of June 1st,* 1908.

| | |
|---|---|
| Army Headquarters and Army Troops | At Bath (left bank of River Avon). |
| First Army consisting of 1st and 2nd Divisions | On left bank of River Avon at Bristol. |

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[1] The detailed location of these troops is left to the Commander-in-Chief. They are in camps on the left bank of the River Avon at and near the places indicated above. The Commander-in-Chief will detail Staff Officers to go to Bath and Bristol, and to bring him back definite information as regards the camps or billets, and also all necessary details as regards the River Avon, its bridges, &c.

| | |
|---|---|
| Second Army consisting of 3rd and 4th Divisions | On the left bank of River Avon at Bath. |
| Cavalry Brigade, Mounted Brigade and 13th Infantry Brigade | On the left bank of River Avon at Devizes. |

A COMPARISON BETWEEN THE RIVERS AND TOWNS IN NORTHERN ITALY AND THE RIVERS (AND WATERWAYS) AND TOWNS IN THE SEVERN VALLEY.

(1) The Severn, between Bridgnorth and Bristol, is, in its course, not unlike the upper waters of the River Po between Turin and Pavia.

(2) Of the affluents, the Avon may be taken to correspond to the Ticino, the Stroud and Swindon Canal to the Agogno, the Avon Canal (near Tewkesbury) to the Sesia, the Worcester-Birmingham Canal to the Dora Baltea, and the Worfield Brook to the Dora Riparia. On the right bank of the Severn, the Wye may be taken as corresponding to the Tanaro, and the Usk to the Scrivia.

(3) The relative position of :—

| | | | | | |
|---|---|---|---|---|---|
| Bristol | may be | taken | to correspond | with | Pavia. |
| Tewkesbury | ,, | ,, | ,, | ,, | Casale. |
| Evesham | ,, | ,, | ,, | ,, | Vercelli. |
| Worcester | ,, | ,, | ,, | ,, | Brusasco. |
| Stourport | ,, | ,, | ,, | ,, | Chirasso. |
| Bridgnorth | ,, | ,, | ,, | ,, | Turin. |
| Ross | ,, | ,, | ,, | ,, | Alessandria. |
| Brecon | ,, | ,, | ,, | ,, | Genoa. |
| Gloucester | ,, | ,, | ,, | ,, | Valenze. |
| Devizes | ,, | ,, | ,, | ,, | Vivegano. |

A comparison of the distances between the English places named will show that they are nearly the same as the distances between the corresponding Italian towns.

## GENERAL REMARKS.

The tour, as usual, brought out some very interesting points; the actions were severe and the number of killed and wounded very great. On one day alone (*vide* narrative, June 3rd) there were no less than 2,444 wounded, and it taxed one's powers to know how to deal with so large a number. The railway could not be used, the field ambulances were required to advance in a few hours, and local transport was not procurable. Of the 2,444 wounded, 489 were able to walk, 1,465 required sitting down accommodation, 367 required lying down accommodation, and 123 could not be transferred on account of their severe injuries. Fortunately a large amount of mechanical transport arrived from the base during the night with supplies for the troops, and as these waggons were returning empty at dawn

1,954 wounded were transferred in them to the base hospitals at Bath and Bristol. The 490 who required lying down accommodation or could not be moved any distance were taken to neighbouring buildings and attended by the *personnel* of some of the tent subdivisions, and so the greater part of all the field ambulances were able to go forward with their respective divisions, the subdivisions left behind rejoining their headquarters shortly afterwards, the sick being taken over by lines of communication medical units. During this rapid advance it was found necessary to bring up by road the *personnel* (less Q.A.I.M.N.S.) of two general hospitals (mobilised and waiting at Bath and Bristol), and establish hospitals at Gloucester and Cheltenham, taking over buildings and procuring equipment locally.

Railway communication was shortly afterwards restored, and three ambulance trains quickly relieved the congestion; an advance depôt of medical stores and a sanitary section also came to railhead. Several clearing hospitals, which had all along been badly wanted, but could not leave the base for want of transport, came up in the empty ambulance trains and were soon in full working order between the field ambulances and the hospitals before mentioned at Cheltenham and Gloucester.

The enemy had also suffered severely; their sick and wounded during the rapid retreat were left in the towns before mentioned, and this fact had to be borne in mind when making arrangements for the accommodation and treatment of our own wounded.

The RED side had two armies. Each army had a Director of Medical Services attached to the Staff of its General Officer Commanding. There was also, I presume, a Director of Medical Services on the Staff of the Commander-in-Chief; consequently, there were three great masters. I would like to know if I was correct in presuming that there was a Director of Medical Services on the Commander-in-Chief's Staff, and if not, who was at the head of medical affairs? Again, if only one Director of Medical Services is to be found with a field force of two armies, what officer is attached to the Staff of the General Officer Commanding each army? Is there no one between the Director of Medical Services on the Commander-in-Chief's Staff and the Administrative Medical Officers of Divisions? In short, should there be three Directors of Medical Services or only one?

"Combined Training" distinctly lays down what medical unit should accompany an advance guard, but says very little about the composition of a rear guard. During this Staff Tour our enemy must have had several rear-guard actions and lost very heavily. We were supposed to be a civilised nation, and, of course, the wounded left behind were protected and cared for in accordance with the rules of the Geneva Convention, but had we been savages the case would have been very different, and a large medical unit with enormous transport would have been required with our enemy's rear guard. It would be very interesting and instructive if one of our officers used to savage warfare would give us his opinion and experiences on this point. I have heard the opinions and experiences of combatant officers, and am told that five or six dhoolies are allowed per 100 men in a rear guard; many officers, I am sure, would like further instruction on this point.

"Combined Training" states that, in the main body, field ambulances should follow the ammunition column; in front of the ammunition column would perhaps be better, as they would probably be required before the reserve ammunition, and would be in a better position to follow the brigades should the division be ordered to be split up.

In stating the number of daily casualties, officers are very apt to forget the number of daily sick from causes other than actual fighting; this fact should be mentioned by medical officers attending Staff Tours to the various officers commanding divisions. The number of daily sick will probably increase during the first week of a campaign and then decrease, as the men get harder, unless some epidemic takes place. This is an important matter with a large force and should be taken into acconnt.

Lately several officers have asked me to let them know briefly the whole routine of a Staff Tour. I would refer these officers to Captain Marindin's book on "Staff Rides" (published by Hugh Rees, Ltd., 119, Pall Mall, S.W.). I think they will find in that small volume most of the things they want to know; a glance at pp. 177, *et seq.*, "Combined Training," might also help them.

Briefly the procedure is as follows:—

The General and Special Ideas, maps, &c., are sent from the District Staff Office some days before the Tour commences. "Appreciations of Situation" are called for by a certain date. An appreciation is selected to be worked out on the Tour, and "operation orders" are written to carry out the plan proposed in the appreciation selected.

Of course the medical officer sends in his appreciation, as I have stated before; but as soon as he becomes aware of the appreciation selected he should write a second appreciation and keep it by him for reference; he will find it a very great help. The daily work depends upon what position the medical officer is ordered to occupy. As a rule he should on the first day (evening of arrival) assume the post of Director of Medical Services. The second day he should be the Administrative Medical Officer of a Division, and this, in my opinion, is the most important position for a medical officer on a Staff Tour, for we all aspire to being Divisional Administrative Medical Officers some day, if nothing higher. As an Administrative Medical Officer he should issue orders to officers commanding field ambulances[1] and instructions to the other medical officers of his division—orders for insertion in General Officer Commanding's operation orders should be sent to the General Staff. He communicates with the Director of Medical Services respecting evacuations, &c., and writes sanitary reports on towns, bivouacs, and camps if he has the time (acting as his own Sanitary Officer).

On the third day he should be the Administrative Medical Officer of another Division, and on the fourth day act as Deputy Director of Medical Services of one of the lines of communication. As such he will arrange for the evacuation of the sick by ambulance trains or road transport and carry out the several duties connected with clearing hospitals, sanitary sections and sanitary squads, hospitals on the line of communication, depôts of medical stores, and hospital ships, and leave the officers commanding Divisions to write their own operation orders, which is very good practice for them.

Each day the work begins about 9 a.m.; the medical officer will probably accompany one of the officers commanding a division and with him reconnoitre a position, inspect towns for hospital accommodation, report upon a camping ground, inspect roads and sites for field ambulances with their dressing stations (acting as though he were the officer commanding each field ambulance in turn), and throughout the day be as much as possible in consultation with the aforesaid General Officer Commanding; it is wonderful what useful knowledge one acquires in this way.

Between 3 p.m. and 5 p.m. headquarters will be again reached, and before 5 p.m. the narrative will be published. Many officers have asked me what is meant by a "narrative"—it is for their edification that the narrative of June 3rd is hereby appended in full.

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[1] I know this action has been queried, and it is sometimes asked, "Does an Administrative Medical Officer command the field ambulances in the same way that an artillery officer on the General Officer Commanding's Staff commands the batteries?" No doubt the new edition of "Regulations, Army Medical Services (War)," will explain this and many other details we are all anxious to know.

NARRATIVE (RED), JUNE 3rd, 1908.
Situation 10 a.m. to 1 a.m.

(1) Nothing serious happened during the night, and the troops moved off this morning at the times and by the routes ordered.

(2) The cavalry became engaged, and about 10 a.m. were manœuvring on the line, Coates-Siddington, against a somewhat inferior mounted body with artillery. Between 10 and 11 a.m. the Devizes detachment came up in support, reporting its arrival to the General Officer Commanding Independent Cavalry, under whose orders it had been placed.

(3) The IV. Division arrived north of Rodmarton, where it was halted by order of the Commander-in-Chief and retained by him as the General Reserve.

(4) The III. Division, having deployed its leading Brigade in rear of the Minchinhampton Ridge, advanced to the Stroudwater Canal and became lightly engaged with the enemy, who was posted on the further bank.

(5) The II. Division, moving down the Nailsworth-Stroud ravine, was fired on by artillery and infantry as it neared Stroud, and came into action against hostile infantry on the further bank of the canal.

(6) The I. Division, on the top of Nympsfield Hill, moved some light troops down toward the canal on the left of the II. Division.

(7) The II. Mounted Brigade, closing to its left in the early morning, had effected a lodgment on the opposite side of the canal, and at this time (10 to 11 a.m.) held the line Wheatenhurst-Whitminster-Nastend.

(8) The fighting up to this hour (11 a.m.) has not disclosed either the numbers or exact positions of the enemy; but it has been estimated that the enemy has brought two Brigades field artillery into action between Sapperton and the Severn.

(9) *Situation 5 p.m.* The Independent Cavalry slowly forced back the hostile cavalry through Cirencester to the neighbourhood of Winstone. The RED cavalry halted in touch with the enemy on the line Rendcomb-Moor Wood. The I. Mounted Brigade at Duntisbourne Abbotts. The Devizes detachment halted between Duntisbourne Rouse and Daglingsworth.

(10) The IV. Division remained in reserve at Rodmarton.

The III. Division reached the line Edgeworth-Bisley-Stroud, with two Brigades supporting the II. Division and pressing back the enemy. The Reserve Brigade remained south of the canal at Hyde.

(11) Two Brigades II. Division, supported by a portion of the Divisional Artillery, attacked Randwick and Haresfield Hills from Stroud. Two Brigades I. Division, supported by Divisional Artillery and II. Mounted Brigade, also attacked these hills from the south and west.

The attacks were delivered simultaneously between 3.30 and 5 p.m. After desperate fighting Randwick Hill was captured by the Red troops, but an assault on Haresfield Hill was repulsed with great loss. The Reserve Brigades of the I. and II. Divisions only reached the canal.

(12) The troops of the Red army are exhausted by their long and arduous day's work.

Casualties.

| | Men | | | Horses |
|---|---|---|---|---|
| | Killed | Wounded | Missing | |
| Cavalry | 30 | 120 | 10 | 80 |
| I. Mounted Brigade | 50 | 180 | - - | 60 |
| XIII. Brigade | 15 | 40 | -- | |
| IV. Division | 1 | 10 | 0 | |
| III. ,, | 47 | 230 | 17 | |
| II. ,, IV. Brigade | 91 | 411 | 130 | |
| V. ,, | 73 | 394 | 112 | |
| I. ,, I. ,, | 79 | 440 | 30 | |
| II. ,, | 80 | 512 | 45 | |
| II. Mounted Brigade | 20 | 107 | 37 | |

As soon as the narrative is issued the General Officer Commanding in Chief writes his operation orders, and it is well that the medical officer should be with him when he does so; many points concerning medical units will be embodied in his orders, and he will probably need the medical officer's advice. An account of all the work, meantime, that has been done during the day has been handed in to the Directing Staff (on which there should certainly be a medical officer). This work is criticised, corrected, and handed back to its originator. After dinner a conference is held, and then the work for the following day is given out, the subordinate commanders writing their orders. It is here that a medical officer can again be of great use by assisting the aforesaid officers to write their orders respecting medical units properly; at the same time he writes his own orders and instructions as Deputy Director Medical Service, Administrative Medical Officer, or Officer in Command of a field ambulance, whichever the Director wishes him to be.

In conclusion, I would ask some medical officers to disabuse themselves of the idea that they are going on a Staff Tour as a sort of duty that has to be done somehow, and that other officers could get along just as well without them. We have to learn and we have to teach—an interchange of ideas takes place; it has been proved over and over again that officers of other branches of the Service are exceedingly keen to learn our organisation, and are only too glad if they can help us to understand theirs. On the last day of a recent Staff Tour a very senior combatant officer remarked to me as I left for London: "I am sure this Staff Tour has been a most instructive one, and I hope it has also been to our mutual advantage." This alone, by no means a solitary instance, bears out what I have just stated.

# THE VALUE OF KOCH'S TREATMENT OF MALARIA.

By Captain N. E. HARDING.
*Royal Army Medical Corps.*

When it is considered that every year in India alone, according to the high authority of Ross,[1] "several millions die directly or indirectly of malaria," and that even the conservative estimate of Rogers[2] does not reduce the number below a million, it might well have been expected that a method of treatment proposed by the illustrious Koch,[3] and prominently brought to the notice of the medical profession in that country by Franklin,[4] would have met with prompt and thorough trial and full discussion. The smaller text-books, however, make no mention of the treatment, but when we examine the larger works we find Thayer[5] saying: "Koch, in order to avoid relapses, advises the administration of 15 grains of quinine about every seven days for two days in succession, this treatment being continued for two months," apparently a confusion between Koch's earlier plan of giving a gramme of quinine every fifth day for a month—a plan abandoned because he occasionally got relapses with it—and his method of prophylaxis, and in addition Thayer offers no opinion as to its value, merely saying that continuous is better than intermittent treatment. Manson[6][7] also makes no reference to Koch's treatment, but advocates the administration of a 15-grain dose every tenth and eleventh day after an attack for six months, and observes parenthetically that a cure is not always thereby secured. Scheube[8] again says nothing about it, though he points out the superiority of the gramme dose employed by the German physicians to the smaller and more frequent doses used by the English; and Rogers[9] is equally silent.

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[1] *Lancet*, September 28th, 1907.

[2] "Examination into 1,000 Deaths due to 'Fever' in the District of Dinajpur in 1903."

[3] *Zeitschrift für Hygiene*, xliii., pp. 1-238, reviewed in *Deutsche medizinische Wochenschrift*, xxix., No. 28; "Literatur Beilage," p. 171.

[4] *Annual Report of the Sanitary Commissioner with the Government of India*, 1902.

[5] Allbutt and Rolleston's "System of Medicine," London, 1907.

[6] "Tropical Diseases," London, 1900.

[7] "Lane Lectures," London, 1905.

[8] "Diseases of Warm Countries," translated from the German, London, 1903.

[9] "Fevers in the Tropics," London, 1908.

The Sanitary Commissioner with the Government of India[1] in 1904 says: "In most stations where successful results were reported to have been obtained by quinine administration" the system embraced not only prophylactic doses, "but also the continuous treatment for from six weeks to three months of every patient who had been admitted into hospital for malarial fever during the year, and there is no doubt that this latter measure is of prime importance in the prevention of relapses." After also pointing out how at Kamptee forty-two men contributed no fewer than 100 admissions for this disease, one man being readmitted no fewer than five times, he goes on: "It is obvious that many of these readmissions on account of relapses can be avoided by the institution of a thorough system of quinine treatment and prophylactic administration"; and in the following year he again lays stress on the need for "thorough treatment of malarial patients and cases of latent infection with quinine." Fernando[2] also speaks of a modification of Koch's quinine prophylaxis, which, though only continued for a month after an attack, caused a remarkable diminution in the number of cases of fever on the plantation on which it was tried, and Ross (*op. cit.*) lays down as part of the "ideal procedure for towns in the Tropics . . . the treatment of old cases of malaria with quinine."

At the risk of being thought egotistical it may be as well to tell how I became acquainted with the method, and to give a detailed account of what I actually do, before proceeding to summarise the cases treated, my excuse being its apparent novelty. Almost as soon as I arrived in Burma at the end of 1903 I was struck by the obvious inaccuracy with which nearly every case of pyrexia was diagnosed "ague," and the equally obvious failure of the methods of treatment in vogue to cure genuine cases, methods which gave a man quinine in doses of varying size and equally varying frequency, either by the mouth, rectum, subcutaneous tissue, or muscles, till his symptoms disappeared, and then discharged him from hospital to be detained or readmitted if his symptoms were urgent enough, or otherwise to have his occasional "touch of fever" in his barrack-room, and be a permanent source of infection to his comrades, methods strongly reminiscent of the happily extinct way of treating another chronic infective fever—

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[1] *Annual Report of the Sanitary Commissioner with the Government of India* for 1903, 1904, 1905, and 1906.

[2] *British Medical Journal*, September 28th, 1903.

syphilis. In the course of my search for something better I picked up Franklin's review (*op. cit.*), since when all my cases have been treated according to the following plan with only very slight modifications in detail: On admission, unless there is any obvious reason to the contrary, all cases suspected to be malarial are given 5 grains of calomel, to be followed six or eight hours later by a small dose of white mixture. At the same time a blood-film is taken and if necessary examined at once or ordinarily within the next six hours. Should a parasite be found, I immediately order the medical warrant officer in charge of the case to give the patient 15 grains of sulphate of quinine, dissolved with a slight excess of sulphuric acid in 1 ounce of water, by the mouth irrespective of the temperature, but with the proviso that if vomited it is to be repeated until retained (as far as I can recollect it has never been necessary to do this more than twice). Should there be any doubt as to the nature of the parasites or the number of broods present, a second film is taken at the same time, before the quinine has had time to be absorbed, while should the film fail to show the parasite and yet be at all suggestive of malaria, as from the presence of pigment granules, large mononuclear increase, or swollen and mauve-coloured erythrocytes, another film is taken, but the rule "no parasite, no quinine," is strictly observed. The following morning the same dose of quinine is given, again irrespective of the temperature, and a film is generally taken to see whether the parasite has vanished; if not, a film is taken every morning till it has. The dose is repeated on five further consecutive mornings, and the patient is then fit for discharge as a rule. If only small rings are found, films are taken after a lapse of a week from the first discovery of the parasite until crescents are found, and if not found after a week's daily search the case is recorded as "parasite found, but not differentiated," as in my opinion it is impossible to be absolutely certain as to the nature of a small ring. On discharge the patient is given a paper telling him on what days he is to attend for further doses, and a duplicate of this is kept by the nursing sister, assistant surgeon, or hospital assistant whose duty it is to give them, and who reports any failure to attend to me, each dose being shown by ticking off the date, so that when treatment is completed a record exists of the actual number and date of those taken. When handing him the paper I personally warn the patient that in the interests of his comrades no less than of himself he should come on the appointed days, explaining the reason for this, and in general he gives but little trouble in this respect, while if he fails to come I send him a message or note to the effect that if he does not come I shall have to send for him officially, a hint which is invariably quite sufficient. He is not struck off any duty to allow him to do this, the only concession being that he can come at any hour of the day most convenient to himself. The dates for further doses are calculated by taking the tenth and two subsequent days from the first dose, and every tenth day after them for three months; for instance, a man in whom the parasite was found on May 1st would receive doses on May 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 11th, 12th, 13th, 21st, 22nd, 23rd, and 31st, June 1st, 2nd, 10th, 11th, 12th, 20th, 21st, 22nd, and 30th, July 1st, 2nd, 10th, 11th, 12th, 20th, 21st, 22nd, 30th, and 31st, *i.e.*, not fewer than thirty doses. In cases of malignant tertian I take films from time to time during treatment so as to see when crescents have disappeared, and on completion of it I always see the patient myself, and again some months later, to find out how he has been, and to take films from him. At first, in the attempt to be wiser than my master, and acting on the supposed lesser resistance to quinine of the benign than the malignant tertian parasite, I only treated cases of the former for six weeks, with the result to be seen below.

I have kept notes of all cases that have been in my care for more than a few days, but owing to changes of station, failures to keep up treatment, and various other causes, find I have only twenty-five which can be traced for at least six months after completion of treatment, and a brief abstract of each of these is given below.

### (*a*) CASES DIAGNOSED ON CLINICAL GROUNDS ALONE, *i.e.*, BEFORE A MICROSCOPE WAS AVAILABLE.

(1) Originally contracted at Bhamo in July, 1903; thereafter had a rigor about once a fortnight, but was only detained and never admitted. Given sixteen doses between May 25th and July 26th, 1904. Seen again on August 9th, 1905, when he stated he had been entirely free from fever since beginning treatment.

(2) Originally contracted at Bhamo in August, 1903. Had occasional rigors, but was not admitted till September 29th, 1904, when he was treated with quinine and discharged on October 10th, only to be readmitted three days later, and given 20 grains of sulphate of quinine daily, despite which he seems to have had a rigor on the 15th. On the 22nd the following note appears in the ward prescription book: "Stop quinine except on days you

expect fever." On the 29th he had another rigor, and his temperature rose the two following days. On November 1st the note appears: "Quinine 25 grains in solution at 7 a.m. alternate days"; on the 5th: "Quinine 25 grains on day of fever only"; and on the 6th: "Quinine 25 grains every second day." On the 12th his temperature rose again, and on the 14th he had a definite rigor. On the 16th he was given "20 grains quinine every second day," and on the 20th and 22nd his temperature rose again. About the 26th he came under my care, and from that day onwards was given 15 grains a day and was free from fever till discharged to duty on December 5th. Seen again by me on February 10th, 1905, when he stated he had been free from fever since discharge. He had lost the sallow cachetic look and been doing full work. March 5th, completed treatment, patient having been quite well from beginning it. Unfortunately the paper showing the actual number of doses taken was lost. March 18th, film showed no evidence of malaria. December 26th, 1905, quite free from fever up to date.

### (*b*) PARASITE FOUND BUT NOT DIFFERENTIATED.

(3) Infected at Fort Syriam, Rangoon, in June, 1906, and first had a rigor on July 3rd. July 4th, admitted; film showed rings, about 3 $\mu$ in diameter, fairly common. July 6th, rings about the same size, common in morning, but doubtful if any present in afternoon. July 7th and 8th, no parasite seen. July 15th, discharged. Had in all thirty-three doses. In October he was in hospital for five days with simple continued fever, but no parasite was found and no quinine was given, so it was probably non-malarial. October 1st, 1907, quite well and free from fever since last note; film appeared normal.

(4) Infected at Rangoon itself; first had a rigor on August 4th, 1906. August 6th, admitted; film showed small rings to be fairly common both morning and evening. August 7th, 8th, 12th and 13th no parasite seen. August 13th, discharged. September 18th, completed treatment, having had eighteen doses in all. March 17th, 1908, quite well and free from fever from beginning treatment to date; film normal.

### (*c*) BENIGN TERTIAN.

(5) Apparently contracted in Rangoon in November, 1905, when he was admitted for dengue and treated with quinine. After discharge he had several attacks of what was undoubtedly ague from

a clinical standpoint, though he was not readmitted till February, 1906, when he was diagnosed simple continued fever and treated with quinine. After discharge he again had attacks of fever, and was admitted in March with debility. After this he did not recollect having had an attack till June 15th, when he was admitted with a temperature of 104° F. A film taken on June 17th showed half to three-quarter grown benign tertian parasites to be fairly common; another on the 18th suggested that there were perhaps two broods present. June 19th, no parasite seen; discharged on June 23rd. He had in all fifteen doses of quinine up to July 20th, and remained well all this time, but about three weeks later had a rigor. It is not certain whether he had attacks after this, but after his transfer to Port Blair at the end of the year he remained well and free from fever.

(6) Infected in Rangoon; admitted in April, 1906, for dengue, which was probably an error of diagnosis, as he had attacks of fever after discharge, and was again admitted in May for simple continued fever. June 23rd, readmitted; a film showed half-grown benign tertian parasites to be present, but few in number. Another film taken the same evening showed no parasites, as did films taken on the 24th and 25th. He was discharged on June 28th, and had in all sixteen doses up to August 5th. On September 16th, 1907, was quite well and free from fever.

(7) Infected at Fort Syriam, Rangoon; first rigor June 26th, 1906. June 28th, admitted, when a film showed no parasites, and one taken that evening gave negative results. June 30th, film again negative. July 1st, film showed benign tertian parasites to be fairly common, and two or possibly three broods present, the largest nearly full grown and the smallest about 3 to 4 $\mu$ in diameter. Another film taken that afternoon showed only a few half-grown benign tertian parasites. On July 4th he had what was at first thought to be a relapse, but proved to be an attack of dengue (see temperature chart I., showing failure of quinine to affect this). Films taken then and on the 5th, 6th, and 14th failed to show any parasites. July 18th, discharged. On August 22nd he had received in all fifteen doses, in addition to an unknown quantity which he took on his own initiative at the beginning of the month. On September 9th, 1907, he stated that he had suffered from occasional attacks of fever from shortly after last note till April, when he was admitted for a few days. After this he had more attacks, but did not report sick.

(8) Infected at Fort Syriam, Rangoon, and had a rigor daily

from June 27th, 1906, onwards. Detained July 3rd, when a film showed benign tertian parasites to be present in two broods, one almost full grown and the other small. That afternoon he had a rigor, but a film taken then failed to show a parasite. July 4th, admitted, but film negative; discharged on the 11th. July 14th, quite well and film negative. August 16th, had eighteen doses to date and been quite well. September 11th, 1907, stated he was quite well till March, since when he had occasional attacks. A film showed apparently normal blood. It would appear that the attacks of which he spoke were most probably non-malarial or less probably due to a reinfection, as he had again been stationed at Fort Syriam.

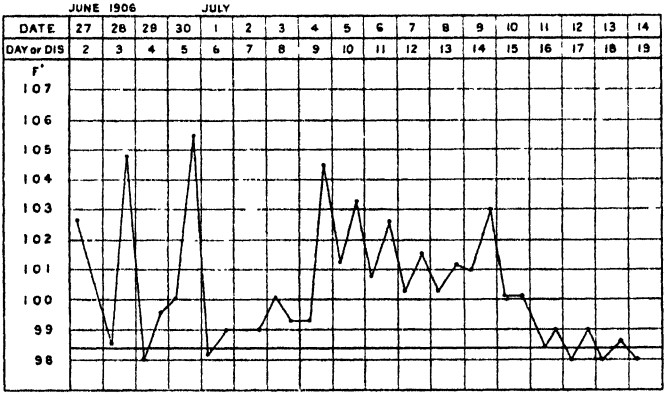

Chart 1.

(9) Infected in Rangoon, July 14th, 1906; detained, when a film showed the benign tertian parasite to be present in two broods, the commonest very small and the other about half grown. Another film taken that afternoon showed benign tertian parasites to be scanty and only one brood present. July 15th, admitted; film again showed two broods, the commonest about half grown; July 22nd, discharged. August 16th, had in all sixteen doses to date and been quite well. October 1st, 1907, quite well since last note, film normal.

(10) Apparently infected in the jungle, where he had been shooting up till July 4th, 1906. Had a rigor on the 17th, admitted on 19th. July 20th, film at 11 a.m. showed benign tertian parasites but doubtful whether in two broods. Another film at 5 p.m. failed to show any. July 21st, film at 9 a.m. showed benign tertian parasites in two broods, one small and the other almost

full grown. July 22nd, film negative; 23rd, ditto; discharged on 27th. August 11th, had in all thirteen doses up to date, quite well all the time. September 3rd, quite well till this date, when he had a rigor. Film in morning showed a number of benign tertian parasites about three-quarters grown and also apparently some very young ones; another film at 5.30 p.m. was negative. September 4th, admitted; film negative. September 5th, film showed a solitary benign tertian parasite; discharged on the 11th. October 11th, had twelve doses to date; case passed out of my hands. September 17th, 1907, has had several attacks of fever, both in and out of hospital, since last note, and is now yellow and debilitated.

(11) Apparently infected either in the guardroom or cells at Rangoon, probably the former. August 11th, 1906, had loss of appetite and headache, but did not think he had any fever till 15th, when he was admitted, but a film was negative. August 17th, films both morning and evening showed what were possibly parasites. August 18th, morning film showed a solitary half-grown benign tertian parasite, and one at 5 p.m. showed several about the same size. August 19th, film negative, discharged on the 26th. September 19th, had in all fifteen doses up to date and been quite well all the time. September 11th, 1907, quite well since last note; film normal.

(12) Probably infected in Rangoon. September 4, 1906, first had a rigor. Admitted on 7th, when a film showed about half-grown benign tertian parasites to be fairly common; another film taken in the evening gave similar results. September 8th, film showed benign tertian parasite in two broods, one about half grown and the other just on the verge of sporulation. September 16th, discharged; had a rigor on the 17th (see chart II.), and admitted on the 18th. Films on the 18th and 19th gave negative results despite prolonged and careful search. September 25th, discharged and diagnosed simple continued fever, though probably a relapse. October 20th, had in all eighteen doses to date. September 8th, 1907, stated he "had not had a day's sickness" since last note.

(13) Bhisti, R.A.C.D.; admitted January 14th, 1907, film negative. January 15th and 16th, benign tertian parasite present, but not common. February 28th, completed treatment, having had in all eighteen doses to date and having been quite well the whole time. July 30th, quite well up to date when fever came on again and a film showed some doubtful small rings and a half-grown benign tertian parasite. July 31st, half-grown benign

tertian parasites common. August 31st, discharged from the Service, so cannot be traced. I do not think there can be much doubt that this was a case of reinfection, as for five months after completion of treatment he remained free from fever.

(14) Lance-naik, R.A.C.D.; admitted March 3, 1907, when a film showed benign tertian parasites to be present, but few in number. March 4th and 5th, benign tertian parasite again found. March 8th, discharged. April 30th, had in all twenty-one doses up to date, and been quite well. June 2nd, fever came on again. June 5th, fever came on again. June 5th, admitted; morning film negative, evening showed a couple of three-quarter grown benign tertian parasites. June 6th, benign tertian parasite found morning and evening. August 27th, completed treatment, having had in all thirty doses to date. March 23rd, 1908, quite well and free from fever since June 8th. It is doubtful whether the second attack was a relapse or a reinfection.

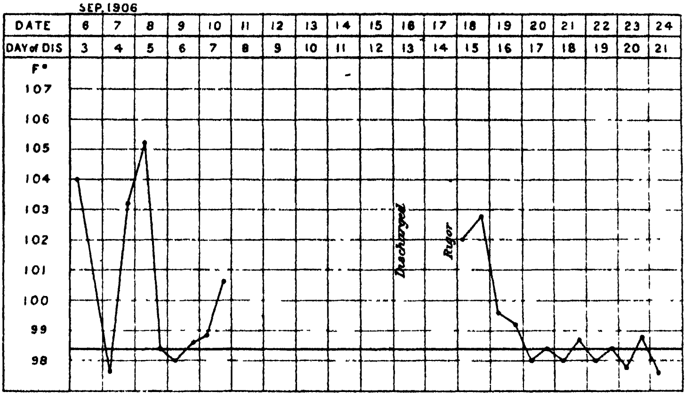

CHART II.

(15) Ward-servant, A.H.C.; stated he had fever for nearly a month daily before March 1st, 1907, when he was detained. A film showed benign tertian parasites in two broods, one young and one nearly full grown, also a benign tertian parasite just prior to sporulation. Another film six hours later showed only one brood of benign tertian. March 2nd, admitted; film showed parasites to be bigger than nineteen hours earlier but not so common. April 30th, had in all twenty-one doses up to date. March 6th, 1908, quite well up to date.

(16) First had fever on June 10th, 1907; detained on the 13th,

when a film showed half-grown benign tertian parasites to be fairly common. June 14th, morning film showed a couple of benign tertian parasites just prior to sporulation, and evening film half-grown benign tertian fairly common. June 15th, admitted; discharged on the 19th. July 26th, had in all eighteen doses up to date. March 23rd, 1908, been quite well, film normal.

(17) Ward-sweeper, A.H.C., first felt sick on August 1st, 1907. August 4th, reported sick, when a film showed benign tertian parasite. August 5th, film showed small rings and also half-grown benign tertian parasite. August 6th, half-grown benign tertian parasite again found. September 27th, had in all twenty-one doses up to date and been quite well, film normal. March 23rd, 1908, has been quite well since last note, film apparently normal.

### (*d*) MALIGNANT TERTIAN.

(18) First attack November 5th, 1904, when he was admitted to hospital for eight days, the entry on his medical history sheet being: "Ague, climatic, mild; quinine; recovered." After discharge had perhaps half a dozen "touches of the ague," but did not report sick. March 25th, 1908, crescents found. March 27th, carefully examined and seemed to be healthy, neither liver nor spleen being enlarged; crescents again found; treatment begun, man not being admitted. March 28th, crescents again found. April 2nd, crescents again found, though perhaps not so common; given a second dose that evening which gave him tinnitus, a thing he had not had before. April 3rd, crescents as plentiful as ever. April 5th, crescents again found, though perhaps fewer in number. About this date I went away on leave and so could not examine his blood. June 26th, completed treatment, having had in all thirty doses and having been quite well all that time. July 24th, no evidence of malaria, even on very careful and prolonged examination of a film. September 29th, no parasite seen; quite well up to January 22nd, 1906.

(19) Admitted October 19, 1905, but film negative. October 22nd, 23rd and 26th, films again negative; discharged on the 27th. November 6th, detained; film showed one or two possible parasites. November 7th, apparently well, so given medicine and duty. November 12th, crescents found but no other form of the parasite present. November 14th, crescents again found and very plentiful; given dose of quinine, which produced very marked headache and tinnitus lasting about six hours. November 15th, given 11 grains

of quinine only, which also produced very marked symptoms. November 16th, crescents again found. November 24th, had a typical rigor; given 15 grains, which was vomited almost at once. November 28th, had a rigor last night, given 10 grains of euquinine, which produced no symptoms, but he had an abortive rigor, temperature rising to 103° F. three and a half hours later; given 15 grains of euquinine the same evening. November 29th, no symptoms from euquinine, but is weak and dizzy on walking; dose repeated. November 30th, had marked deafness about an hour after dose lasting for ten hours or so; dose repeated, and about an hour later he had a feeling of tightness in the head. December 1st, dose repeated but caused such marked symptoms that he felt certain he could not take it except in bed. December 2nd, given 7 grains of ac. quin. hydrochlor. deep into buttock, which seemed to produce few or no symptoms. December 3rd, 4th, 5th, 6th, 7th and 8th, injection repeated; discharged on the 8th, after having been up and walking about for some days. Same injection given on December 12th, 13th, 14th, 22nd, 23rd, 24th, and January 1st, 2nd, 3rd, 11th, 12th, 13th and 21st, up to which date he was quite well and free from symptoms alike from the fever and the quinine. August 8th, 1906, had a letter from him written on manœuvres in Sussex, in which he said he had not "had the slightest signs of fever or ague since arrival in England" at the end of February. I have included this case, though it might be argued that the cure was due to change of climate, on account of the very marked susceptibility to quinine.

(20) Was in jungle on shooting-pass from July 4th to 18th, 1906, with four other men, all of whom developed fever. July 22nd, first felt sick with "cold shivers and pains up the back"; admitted on the 24th. July 25th, film negative, but on 26th film showed a few undoubted small rings and also the rare malignant tertian form just prior to sporulation. Another film taken that evening showed very small rings to be abundant, but no other form. July 27th, morning film showed a few small rings, evening film negative, as were those taken on the 28th, 29th and 31st. August 1st, crescents common, but no other form present. August 4th, discharged. August 7th, crescents present, but not so common. August 17th, only one crescent seen on prolonged search. October 17th, had in all thirty doses and been quite well all the time. Was in hospital under another medical officer with simple continued fever from 20th to 26th, no parasite being found. March 19th, 1908, stated he had an odd day of fever since last

note, but had never reported sick. Film showed nothing like a parasite.

(21) Another of the shooting-party. First had fever on July 24th, 1908, but did not report sick until the 28th, when a film showed very small rings to be abundant. July 29th, admitted; morning film showed very small rings to be absolutely swarming, evening film the same, perhaps half a dozen being seen in a single field. July 30th, film showed only a few small rings; on the 31st, small rings still common. August 1st, what was probably a deformed crescent seen, but no other form. August 2nd, a solitary undoubted crescent found. August 4th and 7th, crescents scanty, but no other form present; on the 9th, discharged, and on 11th crescents scanty. October 21st, had in all twenty-eight doses to date. March 23rd, 1908, went home—time expired—but one of his chums stated he had been quite well since beginning treatment, and he certainly had no admission to hospital during the following six months.

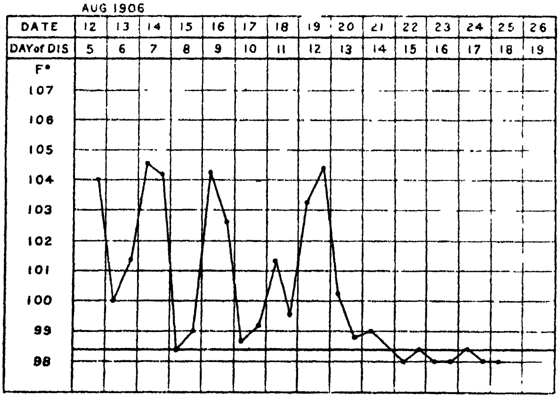

CHART III.

(22) Was in hospital with dengue in October, 1905, which was probably malaria as he got frequent attacks of fever after discharge, and for four days prior to admission had a rigor daily. August 13th, 1906, admitted. August 14th, film negative, but on 16th one or two minute "blue dots" seen, possibly young parasites. August 18th, morning film negative on prolonged careful search, but evening film showed an undoubted crescent. August 22nd, crescents seen, but no other form of the parasite. August 29th, no parasite seen; discharged, still some slight tinnitus and headache from quinine. September 1st to 13th, in hospital with tachycardia and debility,

but had no rise of temperature. Quinine now caused no symptoms. October 29th, completed treatment, having had in all twenty-seven doses to date, and having been free from fever the whole time. March 19th, 1908, quite well and free from fever since last note, film quite normal. I have given the temperature chart III. as it is interesting.

(23) Lance-naik, R.A.C.D.; admitted May 6th, 1907, and stated he had been having "fever" on and off for the past month. Morning film showed a possible but very doubtful parasite, evening film negative. May 8th, film again showed one or two possible but very doubtful small rings. May 14th, film showed a couple of crescents, but no other form of the parasite; on the 22nd, discharged. August 25th, had in all thirty-three doses to date and been quite well and free from fever since discharge. March 23rd, 1908, still quite well, film quite normal. Temperature chart IV. subjoined.

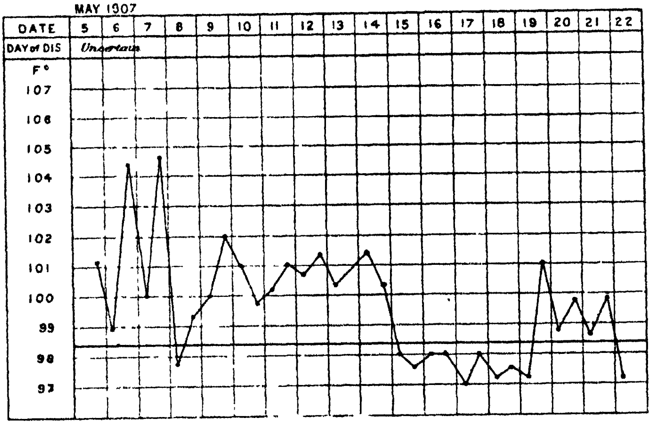

CHART IV.

(24) Lascar, R.A.C.D., June 14th, 1907, detained; stated he had suffered from fever daily for five days, film negative. June 16th, admitted; film negative, and remained so until the 23rd, when a couple of crescents were seen (see chart V.). Discharged on the 29th. September 24th, had in all thirty-two doses up to this date, and remained quite well and free from fever up to February 13th, 1908.

### (*e*) MIXED INFECTIONS.

(25) On August 28th, 1907, detained; film showed a few crescents and some half-grown benign tertian parasites, in addition to a few

small rings. Admitted on the 30th; film showed a few benign tertian parasites just prior to sporulation, but no other form of the parasite. On the 31st, film showed a few small rings, probably malignant tertian. Discharged on September 6th. Treatment completed on November 1st, having had in all twenty-six doses to date. He remained quite well up to March 23rd; film then normal.

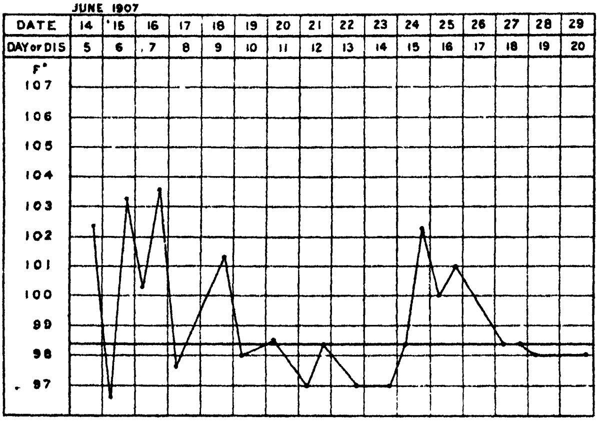

CHART V.

*Remarks.*—It will be noted that, as was the experience of Koch, treatment for a month or six weeks was not invariably sufficient to prevent relapse even in the case of the—supposedly—less resistant benign tertian parasite, whereas treatment for three months certainly was, as it can hardly be doubted that all the cases of malignant tertian were cured, with the possible exception of No. 20, and I think in all probability he was. Is it, then, too much to say that, having regard to the enormous importance of malaria, alike from the point of view of the sanitarian and the economist, this method of treatment of Koch's is the most marked therapeutic advance of recent years, one only to be compared with the discovery of diphtheria antitoxin, and that such a thing as a relapse from malarial fever should for the future be unknown? It must be added, however, that unless the diagnosis is made by the microscope failure and disappointment are bound to ensue, for to cases of liver abscess, enteric fever, septicæmia, pneumonia, and syphilis, all of which I have known treated as malarial, not to mention the various undifferentiated Indian fevers, quinine is more likely to prove harmful than beneficial.

# United Services Medical Society.

## SOME PRACTICAL POINTS IN THE PREVENTION OF DISEASE IN PANAMA AND CUBA.[1]

By Lieutenant-Colonel W. G. MACPHERSON, C.M.G.
*Royal Army Medical Corps.*

A short time ago I was urged to take an early opportunity of bringing forward some of the points I had the privilege of observing, in March last, in connection with the sanitary work of the United States authorities in Panama and Cuba. I am much indebted to the Council of the United Services Medical Society for giving me an opportunity of doing so to-night.

It is common knowledge that a great object-lesson in the prevention of disease has been presented to the world by the United States Government in both these territories. The name of Colonel Gorgas is intimately associated with the work, and, although it is not my intention to detain you with an account of the well-known events that led to the results obtained by him, one or two practical points that are historical are worth noting.

One point that is apt to be overlooked or forgotten is the fact that General Leonard Wood, who was in military command in Santiago when the United States authorities first commenced their sanitary work in Cuba, was an officer who had technical knowledge of hygiene and was thus able to appreciate the practical value of the recommendations of his medical officers. It was he who, first at Santiago and afterwards in Habana, set to work to establish a thorough organisation for supervising the public health and to convert the badly drained, badly paved, and notoriously unhealthy cities into clean, well-organised, modern municipalities. To do this he gave the medical officers *carte blanche* and a liberal supply of money. But what I believe has been of greatest importance in General Wood's administration is the fact that when the medical authorities were anxious to carry out experiments to prove the value of Dr. Carlos Finlay's theory of the transmission of yellow fever by the Stegomyia mosquito, he did not hesitate to sanction the expenditure of a considerable sum of money, some £2,000 I think it was, and to authorise the employment of soldiers, who volunteered to run the risk of acquiring the disease, as subjects of experiment. It is highly improbable that a General would have sanctioned the bold experiments, so brilliantly conducted by Reed, Carroll, Agramonte and Lazear, unless he himself had technical medical knowledge. That General Wood was then in supreme military command is thus a fact of much significance in the history of the extinction of yellow fever.

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[1] **Read before the United Services Medical Society, July 1st, 1908.**

There is another practical point in connection with yellow fever which may also be regarded as historical, namely, that neither in Cuba nor in Panama was the disease extinguished by attacking the mosquito alone. The mosquito campaign was useless except in association with the general sanitary reform of the cities, just as the general sanitary reform of the cities was useless without a mosquito campaign.

In Habana, for example, general sanitary reform was commenced in 1899, but no headway was made against yellow fever until two years later, when Reed's Committee had clearly demonstrated the part played by the Stegomyia in its transmission. By that time the sanitary organisation of the city was as perfect as possible; Habana had been thoroughly cleansed, paved and drained, the water supply was excellent—in fact, always had been so—and there was a fine body of United States medical and sanitary inspectors supervising the public health. Yet yellow fever did not disappear, in fact, was alarmingly on the increase, until the work of destroying the Stegomyia and preventing its breeding in or near habitations was commenced in 1901. When this was started, the disease steadily diminished, and in eight months, by September, 1901, had completely disappeared, after 130 years of endemic prevalence, notwithstanding the great influx of non-immunes from the United States and Spain.[1]

In Panama, on the other hand, the mosquito campaign came first and sanitary reform last, yet there was no result until the two were associated with one another. Colonel Gorgas, who had charge of the sanitary work in Habana, went to Panama in 1904 when the United States handed over the sanitary control of Cuba to the Cuban Republic. He found Panama a city similar to what Habana had been previous to the American occupation; badly paved, badly drained, without organised sanitary supervision. Panama, moreover, was without a water supply, except such as each house provided for itself in tanks and other receptacles. Yellow fever was prevalent, and Colonel Gorgas at once commenced a mosquito campaign. He fumigated every house in the city, not once only but several times, and yet, instead of diminishing, yellow fever increased. It was not until general sanitary reforms were introduced, until a water supply was laid on in pipes, house tanks abolished, sewers and drains laid down, streets paved, and rigid bye-laws and a strong public health administration introduced, that the mosquito campaign had any effect. Because of the want of sanitary reform and sanitary powers at the commencement of the mosquito work it took two years to accomplish in Panama what had only taken eight months in Habana.

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[1] Malaria, too, diminished in Habana *pari passu* with the destruction of mosquitoes.

There is another point of interest in connection with the history of the extinction of yellow fever by the United States authorities. When the sanitary control of Habana passed out of the hands of the United States medical officers, whose interest it was to protect the American non-immunes from the disease, the control exercised by the provincial health authorities, who had not the same fear of yellow fever, became less effective. The latter believed that Cubans were born immune, and they did not recognise the mild fevers of children as probable cases of yellow fever. The mastery over the Stegomyia was gradually lost by their indifference to the disease, and as mosquitoes again began to flourish, so did yellow fever.

It may be mentioned here, incidentally, that Colonel Gorgas does not pretend that it is possible to get rid of the Stegomyia altogether, but only to reduce it to a point at which yellow fever ceases to be spread by it. It is held, I believe, in connection with the Anopheles that, when the number of mosquitoes in a given space is reduced to a certain minimum, malaria is no longer transmitted. So it is, Colonel Gorgas believes, with regard to the Stegomyia and yellow fever. Yellow fever gradually diminishes as the number of Stegomyia to each square yard of surface in a room becomes less, and there is an undetermined minimum, when yellow fever ceases to be propagated although the Stegomyia may be present. It is this minimum that the Cuban sanitarians failed to maintain; so that when the United States again took over the provisional government of Cuba towards the latter part of 1906, they had once more to set to work and stamp out yellow fever, which had again become prevalent throughout the island and had invaded the cities, so long kept free from it by the United States sanitary officers. They had just succeeded in doing so in its last stronghold, Santiago, when I visited that city in March.

Historically, then, we have three practical points to note :—

(1) The influence of a commander-in-chief with a practical and technical knowledge of hygiene.

(2) The importance of associating general sanitary reform, and especially a strong sanitary administration, with mosquito campaigns.

(3) The certainty that the disease will return again if the essential principles are neglected.

I will now pass to some details in connection with the work that I saw carried on in Panama and Cuba, and I venture to do so by illustrating them as far as possible by lantern slides.

First of all, we have a most instructive practical lesson in Colonel Gorgas' system of organising his resources for the prevention of disease in the Isthmus of Panama. We have it illustrated in this chart, where you will see that there is a separate sanitary organisation for the terminal cities, a separate quarantine organisation for their ports, and a separate sanitary organisation for the American posts in the Canal zone.

The terminal cities of the Isthmus, Panama and Colon, have each its own health officer with a large staff of inspectors and labourers. It would take too much time to enter into details of the admirable manner in which their work is carried on. Its thoroughness is very impressive. Colonel Gorgas' first object in Panama was to get rid of the breeding places of the Stegomyia. The habits of the species had been carefully studied, and it was known that it bred almost exclusively in house water or clean water-tanks and similar receptacles, that it seldom migrated from the building where it was bred, and that it was a frail mosquito, easily destroyed. His first measure of reform, therefore, was to introduce into the cities a laid-on water supply from upland collecting areas and reservoirs, and until this was done he knew that it would be hopeless, if not impossible, to apply the bye-laws which he was prepared to enforce strictly, with the view to abolishing the water-tanks throughout the city. And in connection with the system of water-supply his object was to introduce at the same time a water-carriage system of sewage, improve the sanitary construction of houses, and drain and pave the streets. All these measures have now been carried out, and in the city of Panama there is no such thing as a water-tank where Stegomyia may breed. The city is placed under the sanitary supervision of a Medical Officer of Health from the United States, who has a staff of four assistants, nine inspectors, and ninety-two other employees, so organised that it is practically impossible for the people to give the Stegomyia a loop-hole for again existing in any considerable numbers. There is therefore no anxiety whatever as to the possibility of an outbreak of yellow fever occurring in Panama, and the Health Officer's staff is now kept busy in maintaining a high standard of sanitation in the city, and, above all, in preparing to withstand attacks of plague, which threaten it from all sides.

In Colon exactly similar measures have been carried out and the general sanitary work of the city is placed under a Health Officer, with five assistants, ten inspectors, and 223 other employees. The larger number of sanitary employees in Colon depends upon the fact that the city has not yet been so completely reformed as Panama, and the work of paving and reconstructing the houses, draining and so on, is still being actively carried on. The Colon Health Officer and his staff have also under their sanitary charge some outlying labour camps of the Canal zone. As an instance of the stringency of the bye-laws that have been introduced there, in order to prevent the breeding of Stegomyia in the houses, it may be mentioned that a fine of 50s. is imposed upon the occupier of any house where mosquito larvæ are found.[1] In no instance, I was told, had this fine to be imposed a second time upon the same person. Those of us who have been accustomed to health officers' work in a civil community, as, for example, in Gibraltar and in Indian cantonments and bazaars, know how difficult it is to obtain a conviction that has any deterrent effect, for infringement of sanitary bye-laws. In Habana this difficulty has been surmounted by giving the Health Officer the powers of a police magistrate for dealing with such cases. He sits in judgment upon them himself. As a practical measure in the prevention of disease, this is of the greatest importance, in certain communities at any rate. One may call it despotic hygiene, but it is despotic hygiene that gets results. In Panama the cases of infringement of the city bye-laws are dealt with, as a rule, by the municipal authorities, who are Panameñans. But the United States Government, in its treaty with the Republic, retains for itself complete control over the sanitation of the cities of the Republic, and Colonel Gorgas and the Health Officers under him are no doubt quite prepared to take over the additional functions of administering the bye-laws in Panama, as well as in Colon, should such a measure prove necessary.

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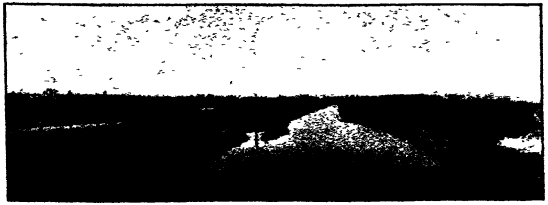
[1] A similar measure was adopted in Habana in 1906.

Colon. Old street.

Colon. New street.

Colon. French Hospital.

Water tanks removed from houses at Colon.



Colon. Main ditch to receive sewage.

Panama. Ancon Hill, site of French Hospital and American Station.

The French, while they accomplished a considerable amount of good sanitary work in the labour camps along the line of the Canal, and erected excellent hospitals at Ancon and Colon, did nothing in connection with the sanitation of the terminal cities, and the great amount of mortality amongst them is attributed to this fact. For example, there is a record of 5,000 deaths amongst Frenchmen in the Ancon Hospital in the period 1881 to 1889, of which 1,200 were deaths from yellow fever, that had been spread from Panama city. Since 1906 there have been no deaths from this disease on the Isthmus, although the number of non-immune white people there has been, and is, very much greater than during the years of French occupation.

The approaches to the Isthmus are protected by a system of quarantine supervision. Both north and south of the Canal zone yellow fever, small-pox and plague are prevalent. In Guayaquil, for example, distant only two or three days journey by sea from Panama and in constant communication with it, all these diseases are raging. Yet the quarantine system, as carried out by officers under Colonel Gorgas, is so good that although cases are detected on the ships and landed for treatment in the hospitals of the Canal zone, they have never given rise to other cases there.

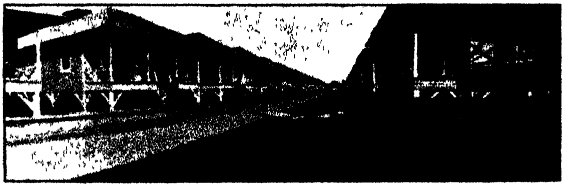
Colonel Gorgas' own powers as Chief Sanitary Officer and head of the Medical Services are practically unlimited. He is one of the seven commissioners appointed by the President of the United States to carry out the construction of the Isthmian Canal. The Chief Commissioner is a military engineer, so are two other Commissioners; the remaining three are the Civil Governor of Canal zone—a strip of territory 5 miles wide on either side of the canal, belonging to the United States—the Commissioner in charge of labour, quarters and subsistence, and a naval engineer, who is in charge of machinery, workshops and municipal engineering. When I say that Colonel Gorgas' powers in preventing disease are practically unlimited, they are, of course, limited by estimates and appropriations. But his estimates are as carefully prepared as the estimates of an engineer who has to build a bridge. Those who have to appropriate the money for bridge construction do not cut down the engineer's estimates and say, "We will give you half of what you ask; go and build your bridge with less material and with material of a cheaper and different quality." To do so would be to court disaster, to throw money away, because a bridge so built would come down with the first traffic that went over it. Colonel Gorgas' sanitary estimates are calculated on much the same basis as the engineer's. They are prepared in minute detail and the minimum sum necessary to obtain results is worked out. But he cannot take less than he estimates for and still get results. That is, I think, his position. President Rooseveldt, in making the chief Sanitary Officer one of the Commissioners has secured for him, in the only way possible, the power and authority that were necessary to obtain results.

It is interesting to note what proportion these estimates bear to the estimated cost of the Canal. Indeed, the question of cost in proportion to results is a practical point in the prevention of disease which sanitarians would do well to consider. The sum estimated as necessary to construct the Canal is £40,000,000, spread over a period of ten years. Of this sum, Colonel Gorgas' department is spending about £400,000 annually or £4,000,000 in ten years; 10 per cent., in fact, of the total sum required for the construction of the Canal. But this sum includes all the services, hospital as well as sanitary, which you see here on the chart. It is somewhat difficult to separate out the proportion spent in purely preventive medicine; but I gather from Colonel Gorgas that it was about £100,000 annually, or 2½ per cent. of the total cost of construction. I think we must all agree that this is a good insurance. Would not the cost of the Canal be increased by a considerably greater percentage were the sanitary measures less complete?

Large sums have been appropriated for the sanitary reconstruction of Panama and Colon. But this amount will be refunded by the cities in fifty years by means of a water rate. This rate is only 1s. 7½d. per 1,000 gallons in Panama, and 1s. 4½d. in Colon. When one realises that it not only covers the sinking fund, but also the maintenance of the water supply, sewerage, paving, &c., as well as interest of 3 per cent. per annum on the money lent by the United States for the work of sanitary reform, one must conclude that the population of these cities is uncommonly well off.

In the Canal zone, where the work of canal construction is going on, the organisation for preventing disease is kept entirely separate from the organisation for treating disease, although both are under the Chief Sanitary Officer. During the year ending June 30th, 1907, the average number of employees on the zone was 32,324, of whom 7,727 were employees from the United States of America, and the remainder, partly coloured labourers from the West Indian Islands, and partly European labourers, chiefly from Spain and Italy. A considerable proportion of the employees is accompanied by their wives and families. They are housed in huts which are distributed along the line of the Canal, in some seventy-eight camps, grouped in fifteen divisions. The whole of the sanitary supervision and of the sanitary works that have to be carried on within these divisions and camps is under a chief sanitary inspector, who is directly subordinate to Colonel Gorgas. The chief sanitary inspector has a staff of ten assistants in his office, he has two special inspectors with him, and at present a gang of eighty-six labourers under an American foreman for special work in connection with a method of drainage, to which I will refer later on. In each of the fifteen divisions there is one or more sanitary inspectors with gangs of labourers. The number so employed varies according to the size and importance of the division and the number of labour camps included in it. Thus in one division with only three camps there are one inspector and twenty-two labourers, while in another division

European labour gang at work. Canal zone.



A Labour camp. Canal zone.

with eleven camps there are five inspectors and 159 labourers. These men are employed in cutting, burning, and removing brush, in draining and filling in swamps, in cutting and burning grass, in digging ditches, laying drains, cementing ditches, cleaning and grading ditches, digging or filling in latrine pits, erecting latrines and supervising them, emptying refuse and night-soil receptacles, disinfecting and fumigating houses ; all the work being carried on systematically by organised gangs under foremen. There is a system of regulating the exact amount of work done, and of keeping each inspector and his gangs informed of the results of their work. Each week a short table showing the number of cases of malarial fever, for example, from the different divisions and camps, is sent to each of the inspectors. The divisions are tabulated in this return according to the position which they hold for the week in the record of healthiness, and it is the endeavour of each inspector to improve his position on the list. Every month all the inspectors meet together in one or other of the divisions, in the presence of the chief sanitary inspector and his staff. Frequently, too, Colonel Gorgas and his staff are present. The practical work that has been carried on in the particular division is demonstrated ; experiences are related and views exchanged as to the best practical methods of dealing with the work. Further hints and instruction are given by Colonel Gorgas and his staff and by the chief sanitary inspector. I was much impressed by the intense activity and emulation displayed by these gangs in obtaining real practical results, and by the manner in which one and all were animated by a belief in their chief.

The disease which is the cause of most inefficiency on the Canal zone is malaria. It was only in the terminal cities that yellow fever was a serious menace to the construction of the Canal. Amongst some of the practical details of the sanitary work on the Canal zone in connection with malarial fever the following may be of interest. The sanitary establishment under the sanitary inspector of each division is divided, as already noted, into gangs, the number in each varying according to the character of the work and the kind of labourers employed. For example, there are ditching gangs, tiling gangs, gangs for screening and repairing screens, and gangs for clearing the brush, gangs for carpentry work and scavengers' work. Each division has also a store for sanitary material in charge of a storekeeper, who may also act as timekeeper. In these stores one finds such articles as axes, shovels, hoes, pick-axes, rakes, nails, screening gauze, refuse bins, disinfectants, petroleum for oiling pools, carpenters' tools, masonry tools, "machetes" for cutting brush and grass, &c.

In connection with ditching and draining of areas in the neighbourhood of habitations, there are one or two practical points which the experience of the sanitary inspectors on the Canal zone has emphasised. In draining a swamp or any low-lying ground at the bottom of a slope or ravine, the drainage ditches are cut along the contour of the lower part of the slope, and not directly down the centre of the area to be drained. This contour system of ditching is found to be far more effective in completely drying up the swamp than the central method of drainage. A considerable amount of labour and expense is required to keep the sides of the trenches free from grass and other vegetation. The Anopheles will not breed except under the cover and protection of this vegetation, and in order to make the trenches efficient, gangs have to be more or less constantly at work to keep the vegetation down. In order to avoid this constant expense Colonel Gorgas has now adopted a method of drainage by what the Americans call "tiling." This is simply a system of laying down agricultural drain pipes, or "tiles" as they are called in the United States, in the trenches and then filling them in with loose stones. Vegetation does not grow in these tiled trenches, and labour gangs are thus no longer required for the continuous work of removing vegetation from the edges.

With regard to oiling, this is used as little as possible by Colonel Gorgas' staff. Colonel Gorgas considers that the breeding places of the Anopheles can almost invariably be dealt with by draining or by screening. Oiling is only used at places where there are springs oozing out at the heads of valleys or slopes, and the oiling of these springs is carried out constantly by drippers, although, temporarily, after heavy rains gangs go over the ground allotted to them and oil the pools left in hoof-marks of animals, &c. The hoof-marks of cattle give a considerable amount of trouble. Low-lying meadows are not uncommon on the zone, and the hoof-marks of cows grazing on them are excellent breeding places for the Anopheles and difficult to attack except by oiling. Instead of petroleum the sanitary inspectors are using a chemical called "Phinotas," which is supposed to be a form of creosol. It has proved more effective than petroleum. Although it is much more expensive, the quantity required is less than one-tenth of the quantity of petroleum for the same extent of oiling. Its special advantage on the Canal zone is that, being heavier than water, it is not blown by the wind to one side of the surface of the pool, as is the case with petroleum. It destroys mosquito larvæ in a few minutes, forms a milky precipitate in the water, and shows up the larvæ. It is also said to be useful for disinfecting, and for preventing the breeding of flies and other insects. One feels that in using a proprietary article one is paying highly for an active ingredient that in its simple form is much cheaper,

A sanitary inspector. Canal zone.

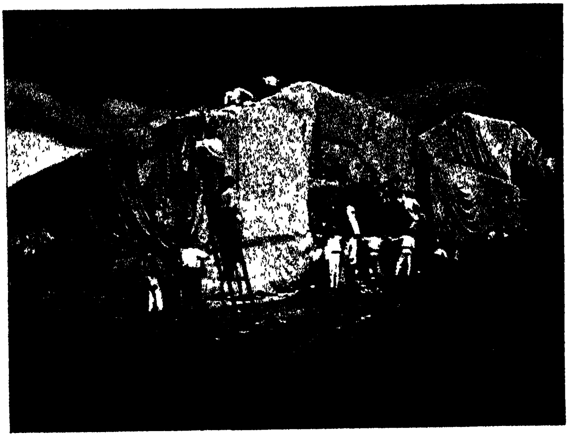
Canal zone. Oil drippers at head of springs.

and in this connection it may be noted that a little carbolic acid added to petroleum has much the same effect as Phinotas. The rule with regard to the distance from habitations to which these measures for the destruction of Anopheles larvæ are applied is a quarter of a mile.

As regards screening, the difficulties that have been most felt on the zone are, first of all, the difficulty of getting a wire gauze that will not rust, and, secondly, the difficulty of protecting the screens from getting broken by men leaning up against them, and so on. With regard to the first point, the material that has been found most useful is a copper-bronze gauze of eighteen meshes to the inch. The gauze has to be carefully tested, and if the amount of iron in it exceeds 1 per cent. it is useless. In Cuba the gauze was being covered with a green paint in order to help in the prevention of rusting. As regards the second point, in addition to the wire gauze screening, a stout wire protecting screen with a large mesh is being placed over the gauze, where men are likely to lean against it, as, for example, over doors and windows and the lower part of the verandah frames.

All the employees of the Canal Commission are encouraged to take quinine. In every mess, whether for American, European, or coloured labour, there is placed on the table at each meal a bottle of solution of quinine in alcohol and a bottle of quinine "tabloids." The men are not obliged to take either, but they are told the value of taking quinine and, as a rule, most of them do take it at their meals. The dose given is 5 grains, and the men prefer the solution to the "tabloids." But in addition to this, in each division there is what is called a quinine dispenser, who goes out with the men on the works, and moves from gang to gang. In this way quinine is given to every man, every second or third day.

As regards destruction of mosquitoes by fumigation and prevention of their breeding in houses by screening the water-tanks, most interesting work was being carried on in Santiago de Cuba. I have here some photographs that were given to me by Captain Thomason, of the United States Army, who is the sanitary adviser to the local Cuban health officer under the United States provisional government. Captain Thomason fumigates a whole block of houses at one time by covering them with tentage, and hermetically sealing the lacings of the pieces of tentage with strips of paper pasted over them. In the vast spaces so enclosed sulphur is burned; or, in rooms and shops where articles are likely to be destroyed by sulphur, tobacco or pyrethrum is used. But sulphur is by far the most reliable.[1] It destroys every living thing left in the houses, including rats, cats, and all kinds of vermin. A point of importance in this method of fumigation is that mosquitoes clinging to the outer walls, courtyards, frames of doors and windows are attacked, whereas in the usual method of fumigation, by burning sulphur in the interiors only, the mosquitoes on the outside walls were untouched.



Santiago de Cuba. Block of houses covered for fumigation.

Santiago de Cuba. Roofs of block of houses covered for fumigation.

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[1] Sulphur in powder form is apt to be adulterated. The sulphur sticks are therefore preferred.

Neither the United States troops in Cuba nor the labour camps in the Canal zone have been free from enteric fever; in fact, there has been a considerable incidence of this disease. Although it is mainly attributed to personal contagion from imported cases and is dealt with by isolation and disinfection, much practical attention is being paid to the prevention of its spread by flies and other insects. The association between flies and disease became very prominent in connection with the American camps in Florida, in

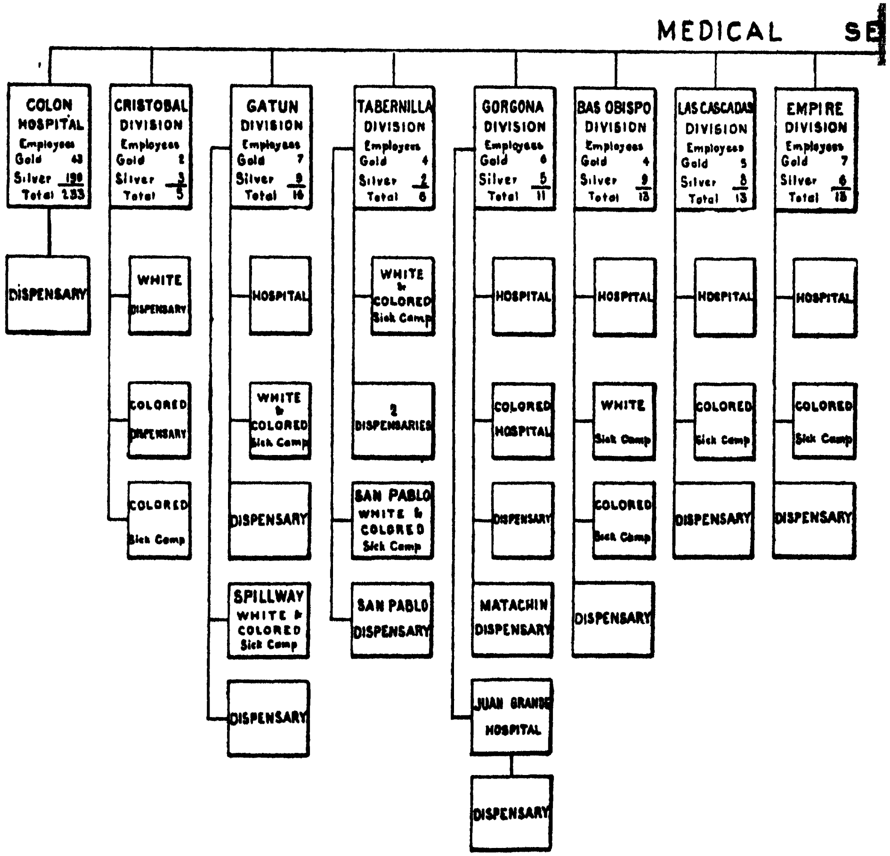
A screened bungalow. Canal zone.

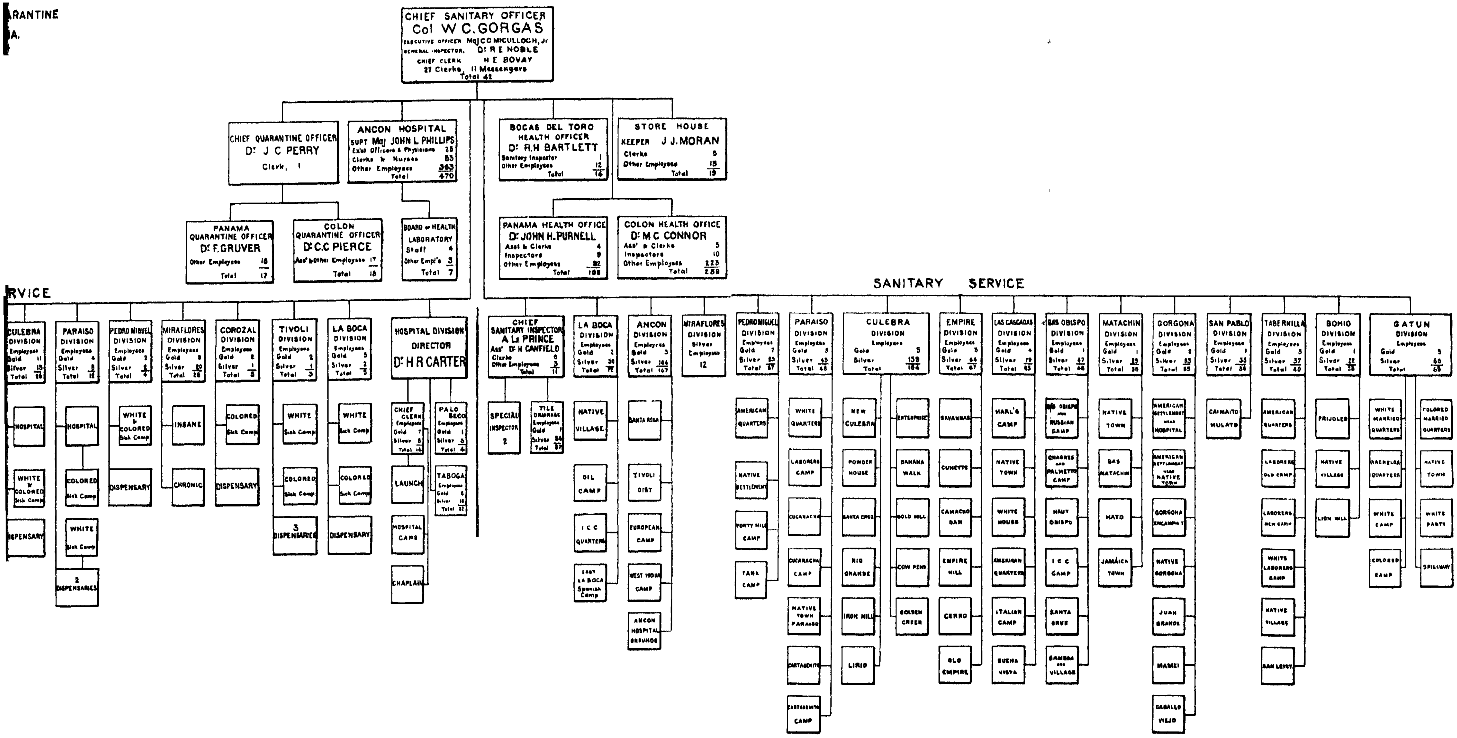
Trough latrine. Canal zone.

1898. Since then the United States medical authorities have made considerable progress in measures for getting rid of flies in connection with habitations and camps, special attention being paid to preventing them having access to latrines and food. On the Canal zone all latrines, no matter of what form, are made fly-proof. The most elaborate latrine is the trough latrine, which is flushed at frequent intervals by members of the sanitary gang, during the time that the latrines are in use in the morning and evening; but in camps where water is not laid on for this purpose, either pit closets or pail closets are used. Both are so constructed as to prevent flies settling on the excreta. In this connection a special point is made of the hinging of the lid to the closet. Instead of being hinged to the seat by an ordinary hinge, the lid is fixed by a couple of rings in such a way that it is impossible for it to remain up when the latrine is not in use, or for the men to prop it up by putting stones or other articles against it. The sanitary inspectors made a great point of this particular form of hinge, and it has been evolved from practical experience. The closets, although well ventilated, have the apertures covered with wire gauze. In the case of the pail closets, the pail is so fixed that it comes close up against the seat when in position, as is shown in this photograph. In the military camps in Cuba the methods were similar, and much attention was paid to close-fitting lids for latrine troughs, and even for urinals; the lid of the latter being a pivoting arrangement, lined with zinc on its under side, so that when the lid of the urinal was opened it formed a urinal slab.

In some of the camps in Cuba, M'Call incinerators have been installed. These incinerators are latrine boxes in which both excreta and urine are received upon metal plates, and at some convenient time during the day incinerated by a fire being lighted under them. They have given great satisfaction to the military authorities and seem to have come to stay. The one practical point about them that is causing some trouble is the difficulty of getting plates for the reception of the excreta thin enough and at the same time durable enough. The thin plates are best for rapid and complete incineration, but they wear away quickly. It has occurred to me that some kind of cheap combustible material, such as a sufficiently stout paper or cardboard, might take the place of the metal plates, and a fresh sheet be put in position daily. The cost of incineration appeared to be very considerable in Cuba. An incinerator at Guanajay dealing with the excreta of 100 men used about £6 daily in wood fuel. This is a very large sum, but

# TABLE SHOWING THE ORGANISATION OF THE MEDICAL, QU
# AND SANITARY SERVICES ON THE ISTHMUS OF PANAM


MEDICAL SE
COLON HOSPITAL Employees Gold 43 Silver 190 Total 233
DISPENSARY
CRISTOBAL DIVISION Employees Gold 2 Silver 3 Total 5
WHITE DISPENSARY
COLORED DISPENSARY
COLORED Sick Camp
GATUN DIVISION Employees Gold 7 Silver 9 Total 16
HOSPITAL
WHITE & COLORED Sick Camp
DISPENSARY
SPILLWAY WHITE & COLORED Sick Camp
DISPENSARY
TABERNILLA DIVISION Employees Gold 4 Silver 2 Total 6
WHITE & COLORED Sick Camp
2 DISPENSARIES
SAN PABLO WHITE & COLORED Sick Camp
SAN PABLO DISPENSARY
GORGONA DIVISION Employees Gold 6 Silver 5 Total 11
HOSPITAL
COLORED HOSPITAL
DISPENSARY
MATACHIN DISPENSARY
JUAN GRANDE HOSPITAL
DISPENSARY
BAS OBISPO DIVISION Employees Gold 4 Silver 9 Total 13
HOSPITAL
WHITE Sick Camp
COLORED Sick Camp
DISPENSARY
LAS CASCADAS DIVISION Employees Gold 5 Silver 8 Total 13
HOSPITAL
COLORED Sick Camp
DISPENSARY
EMPIRE DIVISION Employees Gold 7 Silver 6 Total 13
HOSPITAL
COLORED Sick Camp
DISPENSARY


RANTINE
A.
CHIEF SANITARY OFFICER
Col W C. GORGAS
EXECUTIVE OFFICER Maj C C McCULLOCH, Jr
GENERAL INSPECTOR, Dr R E NOBLE
CHIEF CLERK H E BOVAY
27 Clerks, 11 Messengers
Total 42
CHIEF QUARANTINE OFFICER
Dr J C PERRY
Clerk, 1
ANCON HOSPITAL
SUPT Maj JOHN L PHILLIPS
Ex'el Officers & Physicians 28
Clerks & Nurses 83
Other Employees 363
Total 470
BOCAS DEL TORO HEALTH OFFICER
Dr F.H BARTLETT
Sanitary Inspector 1
Other Employees 12
Total 14
STORE HOUSE
KEEPER J J. MORAN
Clerks 5
Other Employees 13
Total 19
PANAMA QUARANTINE OFFICER
Dr F. GRUVER
Other Employees 16
Total 17
COLON QUARANTINE OFFICER
Dr C.C PIERCE
Ass't & Other Employees 17
Total 18
BOARD of HEALTH LABORATORY
Staff 4
Other Empl's 3
Total 7
PANAMA HEALTH OFFICE
Dr JOHN H. PURNELL
Ass't & Clerks 4
Inspectors 9
Other Employees 92
Total 105
COLON HEALTH OFFICE
Dr M C CONNOR
Ass' & Clerks 5
Inspectors 10
Other Employees 223
Total 238
RVICE
CULEBRA DIVISION Employees Gold 11 Silver 15 Total 26
HOSPITAL
WHITE & COLORED Sick Camp
DISPENSARY
PARAISO DIVISION Employees Gold 4 Silver 8 Total 12
HOSPITAL
COLORED Sick Camp
WHITE Sick Camp
2 DISPENSARIES
PEDRO MIGUEL DIVISION Employees Gold 2 Silver 2 Total 4
WHITE & COLORED Sick Camp
DISPENSARY
MIRAFLORES DIVISION Employees Gold 8 Silver 20 Total 28
INSANE
CHRONIC
COROZAL DIVISION Employees Gold 2 Silver 1 Total 3
COLORED Sick Camp
DISPENSARY
TIVOLI DIVISION Employees Gold 2 Silver 1 Total 3
WHITE Sick Camp
COLORED Sick Camp
3 DISPENSARIES
LA BOCA DIVISION Employees Gold 3 Silver 2 Total 5
WHITE Sick Camp
COLORED Sick Camp
DISPENSARY
HOSPITAL DIVISION DIRECTOR Dr H R CARTER
CHIEF CLERK Employees Gold 7 Silver 6 Total 14
LAUNCH
HOSPITAL CANS
CHAPLAIN
PALO SECO Employees Gold 1 Silver 3 Total 4
TABOGA Employees Gold 6 Silver 16 Total 22
SANITARY SERVICE
CHIEF SANITARY INSPECTOR A Le PRINCE
Ass' Dr H CANFIELD
Clerks 6
Other Employees 3
Total 11
SPECIAL INSPECTOR 2
TILE DRAINAGE Employees Gold 1 Silver 56 Total 57
LA BOCA DIVISION Employees Gold 2 Silver 58 Total 77
NATIVE VILLAGE
OIL CAMP
I C C QUARTERS
EAST LA BOCA Spanish Camp
ANCON DIVISION Employees Gold 3 Silver 164 Total 167
SANTA ROSA
TIVOLI DIST
EUROPEAN CAMP
WEST INDIAN CAMP
ANCON HOSPITAL GROUNDS
MIRAFLORES DIVISION Silver Employees 12
PEDRO MIGUEL DIVISION Employees Gold 7 Silver 83 Total 87
AMERICAN QUARTERS
NATIVE SETTLEMENT
FORTY MILE CAMP
TANK CAMP
PARAISO DIVISION Employees Gold 5 Silver 43 Total 48
WHITE QUARTERS
LABORERS CAMP
CUCARACHA
CUCARACHA CAMP
NATIVE TOWN PARAISO
CARTAGENITA
CARTAGENITA CAMP
CULEBRA DIVISION Employees Gold 5 Silver 159 Total 164
NEW CULEBRA
POWDER HOUSE
SANTA CRUZ
RIO GRANDE
IRON HILL
LIRIO
ENTERPRISE
BANANA WALK
GOLD HILL
COW PENS
GOLDEN GREEN
EMPIRE DIVISION Employees Gold 3 Silver 64 Total 67
SAVANNAS
CUNETTE
CAMACHO DAM
EMPIRE HILL
CERRO
OLD EMPIRE
LAS CASCADAS DIVISION Employees Gold 4 Silver 79 Total 83
MARL'S CAMP
NATIVE TOWN
WHITE HOUSE
AMERICAN QUARTERS
ITALIAN CAMP
BUENA VISTA
BAS OBISPO DIVISION Employees Gold 1 Silver 47 Total 48
BAS OBISPO AND RUSSIAN CAMP
CHAGRES AND PALMETTO CAMP
HAUT OBISPO
I C C CAMP
SANTA CRUZ
GAMBOA AND VILLAGE
MATACHIN DIVISION Employees Gold 1 Silver 29 Total 30
NATIVE TOWN
BAS MATACHIN
HATO
JAMAICA TOWN
GORGONA DIVISION Employees Gold 2 Silver 83 Total 85
AMERICAN SETTLEMENT NEAR HOSPITAL
AMERICAN SETTLEMENT NEAR NATIVE TOWN
GORGONA ENCAMPM T
NATIVE GORGONA
JUAN GRANDE
MAMEI
CABALLO VIEJO
SAN PABLO DIVISION Employees Gold 1 Silver 35 Total 36
CAIMAITO MULATO
TABERNILLA DIVISION Employees Gold 3 Silver 37 Total 40
AMERICAN QUARTERS
LABORERS OLD CAMP
LABORERS NEW CAMP
WHITE LABORERS CAMP
NATIVE VILLAGE
SAN LEVY
BOHIO DIVISION Employees Gold 1 Silver 22 Total 23
FRIJOLES
NATIVE VILLAGE
LION HILL
GATUN DIVISION Employees Gold 5 Silver 60 Total 65
WHITE MARRIED QUARTERS
BACHELOR QUARTERS
WHITE CAMP
COLORED CAMP
COLORED MARRIED QUARTERS
NATIVE TOWN
WHITE PARTY
SPILLWAY

it covers what in other methods of disposal of excreta in camps, such as the Reed trough, would include a water supply, and men and transport material for daily collection, removal to, and disposal of the excreta at a distance.

Fly-proof earth-closet. Pail on frame to fit close to seat.

Fly-proof earth-closet. Pail in position.

The labour camps on the Canal zone, especially those of the coloured employees, are much infected with bed-bugs. The occupants of the huts are constantly changing, men leaving and new men coming in every second or third day. The cots in the huts are made of canvas stretched on metal frames, and the bed-bugs are found in large quantities in the folds of the canvas. In order to destroy bugs and similar vermin a large rectangular iron tank, measuring 6½ feet long by 2½ feet wide and 26 inches deep, is kept at the labour camps for disinfecting the cots and mattresses. It is placed on a wood fire and water mixed with lime is kept boiling in it. The tank can take eight canvas cots at a time, one on the top of the other. The mattresses also, which are stuffed with hair or grass, are disinfected in the same way by being placed bodily into the tank of boiling water and lime.

Incineration is used in connection with the disposal of refuse. The best type of incinerator and the one that is liked most is an incinerator in which the refuse is raked over a series of plates, one above the other, the more combustible material being destroyed in the upper platform, the less combustible coming eventually in direct contact with the fire in the lowest platform. In this way, one avoids clogging the fire with a great mass of refuse partly combustible and partly non-combustible. Two men are required to work the incinerator, one to feed it from above, and one to act as fireman and to keep raking the refuse from platform to platform.

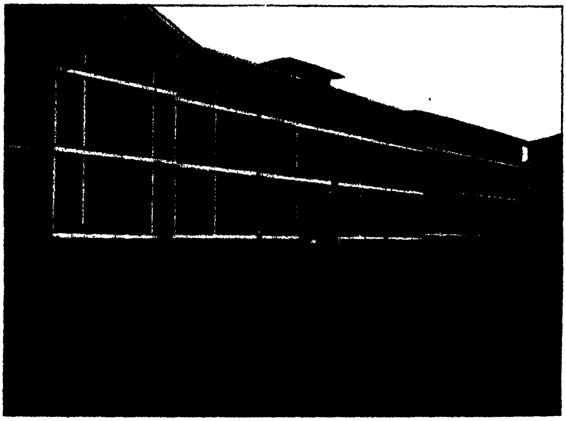
In the camps of the Canal zone flies are kept from food by screening, as is shown here in the kitchen of one of the coloured labour camps. In the Cuban military camps the whole of the kitchen, stores and dining-room block, which is attached by a corridor to each barrack hut, is screened, to prevent the entry of flies. The huts themselves are of an excellent pattern, and can be opened up along the side by means of pivoting panels.

These are a few of the more practical points for reducing the number of flies and vermin in the camps. So far as flies are concerned, the measures have been distinctly effective.

The possibility of water conveying disease is met on the Canal zone by distributing distilled water to every mess, and placing on the mess tables as much iced water and tea as the men care to drink. The ice itself is made from distilled water, and the coolers or receptacles in which the water is kept are locked. The men can only draw it off from a tap. A similar precaution is taken in issuing tea. The men contaminated the tea by dipping their mugs in the tea bucket, and some cases of enteric fever were said to have been traced to such contamination. On the works water boys are employed to distribute distilled water to the men.

In referring to such general matters as barrack huts and their accessories, it may not be out of place to mention the universal use of shower-baths both in the labour camps on the Canal zone and in the military camps in Cuba, as indeed everywhere in American garrisons. We in this country do not yet realise their simplicity, economy and hygienic value, especially for our stations abroad. Indeed, it was only the other day that I was shown an excellent series of body baths at the Guard's camp at Pirbright. There were twenty baths, I think, in an excellently constructed shed, with good concrete floor sloping to surface channels outside. I estimate that with a minimum of 10 gallons of water to each bath, and ten minutes for bathing, 120 men could have a bath in an hour with an expenditure of 1,200 gallons of water. With shower baths, five minutes is a good minimum of time, and two gallons a minimum of

European labourers' mess. Canal zone.



American mess building, screened. Canal zone.

water, so that in one hour by a shower bath system, allowing only twenty shower baths in the same space as the twenty body baths, 240 men could have a bath with an expenditure of only 480 gallons.

Coloured labour kitchen. Canal zone.

Colonel Gorgas and steam shovel. Canal zone.

These are some of the practical points that one may learn from contact with the sanitary work of the United States in Panama and Cuba. There are many other details and masses of statistics which might be added to demonstrate the thoroughness and efficacy of the work. It may not be easy here to realise the stupendous nature of what has been accomplished. But as a writer in the *Lancet* very aptly says, " whether the Panama Canal enterprise will prove the great engineering triumph and commercial highway to which many of us look forward with confidence, time alone will show; but of one credit history can never rob the United States. Among much good and evil it must record that it was under American administration that the knowledge and resources of modern science were applied to the hygienic redemption of the once noisome Isthmus." May I add, in words written to me recently by Colonel Gorgas, that "every success, on these lines, renders the work of future sanitarians easier." Any of us who may have to face similar problems in other parts of the world can point to Panama and Cuba and say, "What has been done there can be done here"; and let us remember that it is our comrades in the United States Army Medical Service who have shown us how the apparently impracticable can be made practicable; for, at the beginning of Colonel Gorgas' work in Panama it was recommended by the Chief Engineer, the Governor and the Chairman of the Commission, in a combined recommendation, that the plans he was working on were not practicable, or could not be carried into practical execution, and that they should be discontinued. This was before Colonel Gorgas had the power and authority of a Commissioner. This Society may also feel gratified at the enormous advances that have been made in recent years in rendering the deadly Tropics healthy. For it is the services, to which its members belong, that have produced the men who are doing and have done for the prevention of malaria, sleeping sickness and Malta fever what their comrades in America have done for the prevention of yellow fever. With records such as these the military medical services of the Anglo-Saxon race may well feel proud. Others have accomplished much in the investigation of disease, but few have had the same practical results in its prevention.

## DISCUSSION.

Lieutenant-Colonel A. M. Davies, in commenting on the paper, showed that malaria prevention must be the result of work carried out systematically on the lines of attacking the parasite in the human body, and the mosquito in its different life stages outside the body, combining with these measures intended to protect the healthy man and the sick man from the bites of mosquitoes.

Major Harrison, Major Russell, United States Army, and Dr. Freemantle also took part in the discussion.

The Chairman summarised the discussion in a short speech, and moved a vote of thanks to Lieutenant-Colonel Macpherson, which was unanimously accorded.

# THE ARMY AND NAVY MALE NURSES' CO-OPERATION.

By Lieutenant-Colonel W. G. A. BEDFORD, C.M.G.
*Royal Army Medical Corps.*

Through the medium of the Journal of the Royal Army Medical Corps I am taking the liberty of addressing my comrades of all ranks upon a matter of very considerable importance to the welfare of our nursing non-commissioned officers and men, and thus indirectly to the good name and reputation of the Corps at large.

How many of us stop to consider what becomes of the many excellently trained non-commissioned officers and men of the nursing section who pass out of our ranks every year into the misty unknown of civil life? Do we appreciate what a long-felt want in the civil community these men would fill, were their talents and energies directed into the proper channels? Must we not confess that we, their officer-comrades, have frequently permitted these men, after having spent some of the best years of their lives in the Army, helping us to cure the sick and heal the wounded, aiding us to build up a reputation for our Corps, and to lay before the world an organisation designed and maintained for the best interests of military humanity, to drift away, not knowing what to do, whither to go, or how to utilise the knowledge and experience which we ourselves have been instrumental in giving to them. The technically trained, tried and efficient male nurse! What a boon to many! What an appropriate attendant in many cases of the ills which flesh is heir to!

With this in view, then, let us all, with one accord, help the much-wanted organisation, which is to direct these men to the logical goal, to which their qualifications should in justice lead them; an organisation which will create a central home, a depôt, a nucleus, and a registry, from which may emanate honourable occupation and remunerative employment, which may prove a haven of rest between tours of duty, and, moreover, be an exhibition of the solidarity of our Corps, and a proof of our feeling of comradeship towards our rank and file.

"The Army and Navy Male Nurses' Co-operation," under the Royal Patronage of Her Majesty the Queen, keenly supported by the Director-General, Sir Alfred Keogh, administered by a Committee of distinguished ladies and men, with Miss Ethel McCaul as Honorary Secretary, promises to give us such an organisation, and to raise up such a home and centre of good work.

I need scarcely add that such an undertaking as this wants money to start it, requires warm hearts and willing hands to help it on its way. Let me, therefore, now beg of you all to do something to help this really worthy scheme. I would urge that Commanding Officers divert some of the profits of our Corps canteens, that individual officers, warrant officers, non-commissioned officers and men, all offer a liberal donation in support of this cause. Sir Alfred Keogh has generously promised £5 5s.; the canteen of No. 6 Company is sending help, and several individual officers and other ranks are coming forward with offers of assistance.

Will not all our companies, at home and abroad, follow suit, and all our officers and soldiers accept the lead of our Chief? In due time the co-operation should be quite self-supporting, but extraneous aid must be forthcoming to launch it on its way.

All subscriptions and donations should be paid by cheque (crossed "Bank of England, Western Branch") to the Honorary Secretary, 47B, Welbeck Street, London, W. These will be gratefully acknowledged in the columns of the Journal. It would much facilitate the movement if Officers Commanding in Districts and Commands would kindly obtain the services of an officer to receive subscriptions from their Command, and transmit them, together with the lists of the subscribers, to the Honorary Secretary, at the above address.

# Clinical and other Notes.

## A CASE OF GASTRO-JEJUNOSTOMY.

By Captain G. J. STONEY-ARCHER.
*Royal Army Medical Corps.*

Serjeant-Drummer S. was sent up to me, from Omagh, by Major McCormack, R.A.M.C. He dated back the commencement of his trouble to April, 1900, when after many hardships in the field he contracted enteric fever in Ladysmith, after which he was invalided home. Shortly after his arrival he was admitted to the Military Hospital, Belfast, for "typhlitis," and on his discharge he was stationed at Omagh. From this time onwards, to use his own words, "he had increasing trouble with his food," and his medical history sheet shows entries for "fæcal accumulation," "dyspepsia" "gastralgia," and "ulcer of the stomach." He stated that for the last four or five years he suffered very frequently from agonizing pain in his stomach, the pain sometimes coming on immediately after he had taken food, sometimes after two or three hours, and sometimes not until the middle of the night, when he would frequently vomit, which would give him relief; taking food also seemed to relieve him sometimes, as did strong whiskey, to which, unfortunately, he frequently resorted. These symptoms culminated on November 24th, 1907, when he was admitted to the Military Hospital, Omagh, suffering from the effects of a serious attack of hæmorrhage from the stomach, which had come on while in his quarters at 4 that morning, when he brought up about 10 ounces of blood. He was suffering such pain that during the course of the day he was given three injections of morphia. Two days later he had another but slighter attack of hæmatemesis, which yielded to treatment.

He was transferred to the Military Hospital, Belfast, January 21st, 1908, the acute symptoms having in the meantime subsided. A few hours after admission he vomited about two quarts of yellow bile-stained fluid, containing particles of undigested food. On examination by combined auscultation and palpation the stomach was found to be dilated, reaching as low as the umbilicus, and to the right as far as the mid-poupart line; when washing it out, it was found to easily hold six pints of water. By succussion splashing sounds could easily be heard. Tongue flabby and coated with white fur; pulse hard; artery walls thickened and evidently somewhat atheromatous; liver, spleen, heart and lungs were normal. General aspect pale and drawn, lips and conjunctiva anæmic. He stated that in the last six months he had lost over 2 st. in weight, and now only weighed 8½ st. There was no evidence of melæna having occurred at any time, but bowels were very constipated and required an enema every day.

He was put on a simple diet and an alkaline bismuth mixture, but the only treatment that seemed to give him any marked relief was having his stomach washed out with a warm solution of bicarbonate of soda; if this was omitted for a day or two pain and vomiting came on again; it was therefore considered that the case was too far advanced for further palliative treatment, and I proposed an operation. Although the risks were clearly explained he willingly consented to have it performed, saying that his life had been a burden to him for years on account of the pain he continually suffered.

Accordingly, on February 24th, 1908, I performed the operation of gastro-jejunostomy as recommended by Mayo, without a loop, and without reversion or dislocation of the jejunum. On opening the abdomen the pylorus and first part of the duodenum were found to be thickened, indurated and firmly bound down by organised adhesions, which passed backwards to the posterior abdominal wall and tc adjacent organs. The pyloric portion of the stomach was also thickened and showed evidences of old ulceration on the outer aspect of the posterior surface. During the operation, which lasted one and a half hours, he vomited three times a small quantity of bilious fluid, although the stomach had been carefully washed out an hour previously; except for this he bore the operation very well, and two hours later, after having a saline per rectum, he was propped up in Fowler's position, and was so nursed for the next three days. After the first six hours he was allowed to drink as much water as he cared for. Shortly after the operation he vomited some bile and "coffee grounds," which was the only time he vomited except on the following morning after taking a cup of tea.

On the evening of the 25th his temperature went up to 102·5° F., and on examination the base of the right lung showed some loss of resonance and some sub-crepitant râles were heard over it. Respirations 30; pulse 110, accompanied by restrained coughing and some frothy muco-purulent expectoration. These symptoms lasted three days, when they subsided by crisis, evidently being due to a mild attack of ether pneumonia. From the morning after operation the nourishment given was: Plasmon water, raisin tea, albumen water and Brand's essence of chicken, which was continued for three days, after which his diet was gradually increased. For three days the lower bowel was washed out every morning with the long tube, but from this time onwards the bowels began to move naturally; this was very satisfactory, as for years he had required strong purgatives or enemata. On March 1st, the wound was dressed for the first time and was found to be soundly healed, and within a fortnight of the operation he was sitting up in a chair and said he was enjoying his food as he had not done for five years. His complete recovery has since been uninterrupted and uneventful, his weight in less than four weeks after the operation was 9 st. 7 lb., a gain of 1 st. having been made from the time he was weighed in Omagh just before being transferred here, and he was discharged hospital perfectly well on March 25th, 1908.

I have to thank Lieutenant-Colonel Porter, R.A.M.C., and Mr. Mitchell, F.R.C.S.I., for their kind assistance at the operation.

I am sending these notes to the Journal as I think they may be of some interest, as these cases are not common in the Service.

## PARATYPHOID INFECTION DURING THE COURSE OF MEDITERRANEAN FEVER.

By Surgeon-Captain R. SAMUT.
*1st R.O.M.R. of Militia.*

The difficulty of diagnosis, from the clinical features only, between Mediterranean fever and enteric fever, is one which has always tried the diagnostic powers of the best clinicians. Nor is this difficulty overcome by the agglutination test, for cases are extremely common in our experience where the symptoms of the disease point distinctly to enteric fever, yet the Widal test, while giving a positive reaction to the *Micrococcus melitensis*, yields absolutely negative results with the *Bacillus typhosus*. In the light of our present knowledge regarding that para-colon family of bacteria which constitute an intermediate group between the *B. coli communis* on the one hand and the *B. typhosus* on the other hand, many of those obscure cases of Mediterranean fever which bear so close a resemblance to true enterica must be classed under a new heading, viz., one of mixed infection not with the *B. typhosus*, but with one of the members of that paratyphoid group which is capable of causing enteric-like symptoms. The following case will serve to illustrate this:—

G. C. Mason, aged 33; admitted to the Central Hospital, Floriana, May 15th, 1908. Patient had complained of severe constipation, giddiness, headache and backache, for about twelve days. On admission he was semi-conscious, temperature 105° F., low, muttering delirium, tongue furred and tremulous, spleen enlarged. On the 21st the serum gave a positive reaction to *M. melitensis* at a dilution of 1 in 50. On the 26th another example of the patient's blood was submitted for examination by Professor C. Mifsud, who was in charge of the case, with a request that it should be tested for enteric fever, as some of the symptoms of the case pointed to that disease. The Widal test was applied, and a negative result obtained with *B. typhosus* and paratyphoid A and B strains, while agglutination was immediate and visible to the naked eye with *M. melitensis* at a dilution of 1 in 80. On June 17th the patient's fæces were sent to the laboratory for examination by Professor Mifsud, who persistently held the case to be one of typhoid and not Mediterranean fever. In fact, blood had now made its appearance in the patient's stools, and the whole clinical aspect of the case was so marked as to warrant such a diagnosis.

Cultures of the fæces were made on phenolated gelatine (0·2 per cent.), since this has the great advantage of inhibiting the growth of most putrefactive organisms which liquefy gelatine, while the growth of the para-colon bacilli remains unaffected. After several passages a colony of motile bacilli was obtained which did not stain by Gram's method, did not coagulate milk, nor produce indol in a broth culture, but fermented dextrose with gas, produced slight blackening of lead subacetate agar, and gave a positive reaction with the patient's serum. A control test of the serum was performed with standard cultures of *B. paratyphosus* A and B, with the result that a positive reaction was obtained with the latter only at a dilution of 1 in 100. The reaction was negative to *B. typhosus*.

A culture was now made from the patient's blood, Castellani's method being adopted, and the greatest care being taken to avoid contamination of the broth. A uniform turbidity was noticed on the second day. Stroke cultures of this on gelatine yielded a greyish, opaque, thick growth of motile rods which were Gram negative, and were agglutinated by the patient's blood diluted 1 in 200. Further examination of these bacilli showed that they did not coagulate milk, but produced in litmus milk a temporary acidity; they did not produce indol in bouillon cultures; they fermented dextrose but not lactose; they produced slight blackening of lead acetate agar; on potato they grew as a dull brown pellicle; they did not agglutinate with normal or blood taken from Mediterranean fever cases. Malachite green and sodium nitro-prusside were not available.

The patient's urine was normal throughout. Rose spots on the skin were not detected. The pulse was slow and dicrotic. Bowels tending to be loose. Slight bronchitis developed during the last week.

The conclusions which may be drawn from this case are:—

(1) That a paratyphoid infection may exist as a complication of Mediterranean fever.

(2) That such a mixed infection is probably responsible for most of those cases of Mediterranean fever which simulate enteric closely in clinical features, yet in which the agglutination test is negative to the Eberth bacillus.

That the Widal test for paratyphoid infection in all long-continued cases of Mediterranean fever becomes necessary and should never be neglected, and where the clinical symptoms are corroborated by this test, that blood cultures should be resorted to as the only sure means of diagnosis.

(4) That the good effects of intestinal antisepsis which has so long been advocated in Mediterranean fever are derived from their action upon that large brood of microbes which are habitually found in the intestine, whose virulence is exalted during the course of the fever, and of which

the paratyphoid bacilli are prominent members. Such drugs as salol, the naphtha group, calomel, thymol, resorcin, carbolic acid, &c., and enemata of boric acid, listerine, eucalyptol in olive oil, &c., find their indication in this connection and should be employed.

(5) That prophylaxis is as urgently required in Mediterranean fever complicated by para-typhoid infection as in cases of true enterica, since the paratyphoid bacilli are virulent, their vitality is even higher than that of *B. typhosus* and dysentery bacilli, and their pathogenicity in man is well marked.

## AN IMPROVED FORM OF IMPROVISED REFUSE DESTRUCTOR FOR CANTONMENTS AND CAMPS.

By Lieutenant-Colonel A. E. MORRIS.

*Royal Army Medical Corps.*

Towards the end of 1906, during the progress of an enquiry into the cause of an outbreak of enteric fever amongst officers of the garrison of Jubbulpore, I noted the large amount of rubbish which accumulated in an Indian cantonment, being collected by sweepers and thrown into heaps, walled enclosures, or old casks with or without lids, waiting for removal by rubbish carts. Theoretically, these carts visit each receptacle once daily, but, according to the efficiency of the service and the amount of supervision given, it is no uncommon occurrence to find rubbish heaps of three and four days accumulation, which in the meantime have been a focus of attraction for myriads of flies feasting on such garbage as may have been swept up with the more innocuous dried grass, leaves, &c.

Our aim during the past eighteen months has been to burn all rubbish as collected and thus remove at least one source of disease.

Lieutenant-Colonel H. P. Elkington[1] directed my attention to a form of refuse destructor made in Aldershot by Lieutenant-Colonel R. Caldwell, the defects of which we found to be the constant attention necessary to remove ash which clogs the trenches, and the insufficient draught which allows the fire to go out. After some experiments an improved form of destructor was adopted, it requires very little attention, has a good draught and has worked extremely well in this station all through the rains, when the greater portion of the refuse to be burnt was damp. Several of a larger type are in use in the Royal Field Artillery lines for the destruction of stable litter, these work well in dry weather, but are not successful during the rains.

The pattern now adopted is much smaller than those at first built, being more convenient, with a better draught than the larger type, and the amount of rubbish consumed in a day is very large, twelve to fifteen cart-loads being easily burnt in the smaller destructor.

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[1] "Notes on Military Sanitation," by Lieutenant-Colonel H. P. Elkington, R.A.M.C.

The method of construction is as follows: The site having been selected, two trenches are dug crossing each other at right angles, each trench being 4 feet long and 10 inches wide, sloping down from each end to a depth of 9 inches in the centre, the ends being further splayed outwards to increase draught.

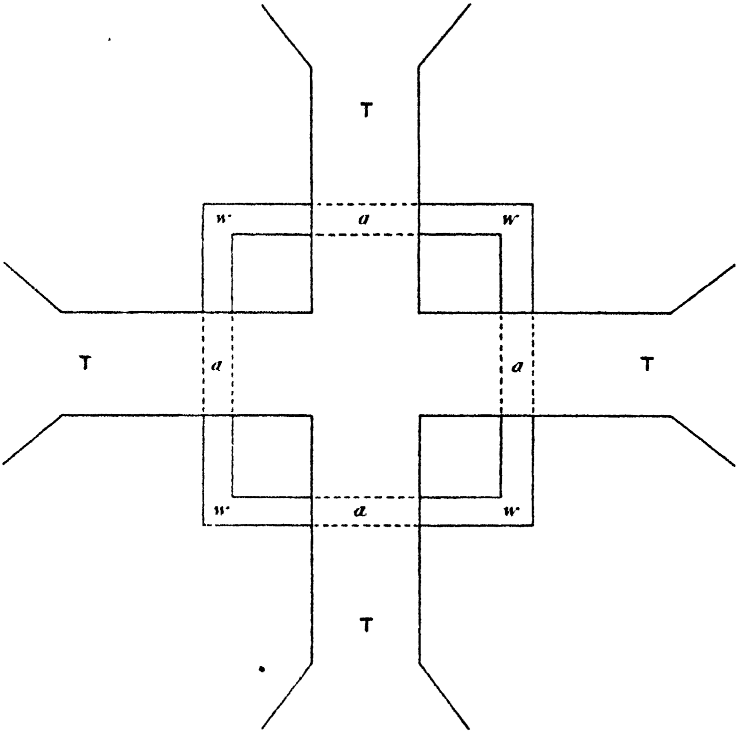

FIG. 1.—Ground plan of destructor. *a*, arches; T, trenches; *w*, walls.

At the intersection of the trenches a square is now laid down 2 feet 8 inches, in outside measurement, and 20 inches inside (*w*, *w*, fig. 1), thus giving a space of 6 inches wide for walls; the intervals at each trench are bridged over with a piece of Merwara flag of a suitable width. On the foundation thus formed seven pieces of angle iron, 2 feet 6 inches long, are laid down at regular intervals to form a grating, the angle being placed upwards, another piece of flag is placed over the ends of the three central bars to hold them in position at the stoke holes (fig. 3, M) and the building of the walls is then proceeded with. The walls may be either of sun-dried bricks set in mud or of old bricks, such as may with a little trouble be collected about cantonments, and set in mud or mortar. A hole 4 inches square is left over the centre of each trench to allow of ash being raked down and the grating cleaned occasionally, another hole being left in each side wall 1 foot higher up to increase draught.

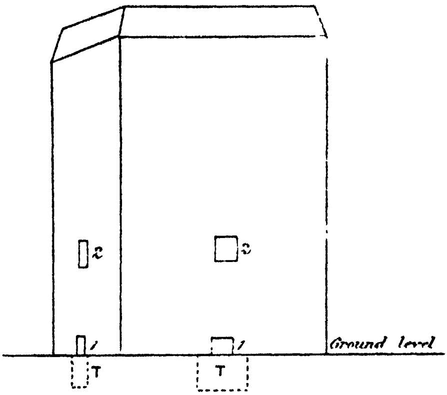

FIG. 2.

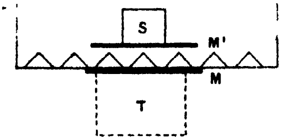

FIG. 3.—End view of grating. M, M', Merwara flags; T, trench; S, stoke-hole.

Just before the rains the walls were plastered over with a mixture of cow dung and clay, the whole was then given a good coating of tar; with this preparation the hospital destructor went through the rains without damage. The cost of this destructor is trifling, the seven pieces of iron cost about 3 rupees, and with a little trouble the other material can be picked up about cantonments; the sweeper can build the walls.

The reduction in cartage by this simple destructor is very great, formerly in this hospital three cart-loads of rubbish were taken away daily, now one cart-load of ash is accumulated every three days. If these destructors were generally adopted fully half the authorised establishment of rubbish carts might be dispensed with.

## THE PREVENTION OF INFANTILE ENTERITIS IN MALTA.[1]

BY MAJOR G. S. CRAWFORD.

*Royal Army Medical Corps.*

THE great cause of infantile mortality in Malta, is enteritis. The number of admissions and deaths from this disease during the last three years is as follows:—

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[1] A paper read before Royal Army Medical Corps Officers' Monthly Meeting, Valletta, Malta, April, 1908.

| | Imtarfa | | Garrison, excluding Imtarfa | |
|---|---|---|---|---|
| | Admissions | Deaths | Admissions | Deaths |
| 1905 | 20 | 5 | 60 | 13 |
| 1906 | 3 | *Nil* | 85 | 13 |
| 1907 | 3 | ,, | 62 | 12 |

It is the wish of our Principal Medical Officer that I should bring under your notice the steps that were taken at Imtarfa in 1906 and 1907 to lower the incidence of the disease, as this may lead to similar measures being adopted throughout the garrison, which may be followed by equally happy results.

On my arrival in Malta, in February, 1906, I was directed to take over medical charge of Imtarfa, and the Principal Medical Officer asked me to pay special attention to the married families, as the place had an unenviable reputation for sickness and high mortality amongst the children. The steps taken to remedy this condition of affairs were:—

(1) The insistence on a high standard of cleanliness of quarters and their surroundings. The quarters were carefully inspected once a week, particular attention being paid to the condition of the water-closets. Latrine brushes were put into every quarter, and their daily use advised. Closet-pans which were found to be coated with fæcal matter were directed to be thoroughly cleaned with a weak solution of hydrochloric acid, and seats were ordered to be kept up when the closet was not in use. All the gully-traps in the vicinity of the married quarters were cleaned and flushed twice a week. The verandahs of the quarters were thoroughly scrubbed at least once a week, and accumulation of refuse, &c., in or about the quarters prohibited.

(2) *Protection of Food-stuffs.*—Food-stuffs were covered with gauze to keep off flies and dust; small wire gauze meat safes were asked for, and in time were supplied, one to each quarter.

(3) *Advice to Mothers.*—Mothers were advised as to suitable clothing and food for childen, also of the necessity for reporting cases of sickness early, &c., as opportunity offered.

(4) *Regulation of Milk Supply.*—Tinned milk only was used, and arrangements were made with the commanding officers concerned to keep both large and small tins for sale at the grocery bar. A particular brand was recommended, the large tins of which cost 5d. and the small ones 2½d.; contractors are very fond of charging 3d. for the small tins, which makes mothers buy large tins, and if the contents are not all used in one day they are likely to become sour. These small tins can be bought locally for 2½d., and contractors are forbidden to charge more than market prices for any article on sale in the grocery bar, so there is no reason why mothers should not be able to always get these tins at 2½d. from the grocery bar. It is one of those apparently trivial points into which it is important to enquire occasionally. Mothers are directed to open the tins by making two small holes in the lid, and to keep the tins in a vessel

containing cold water with the lids covered with gauze when not in use. Some mothers prefer bottled milk, of which there are several brands. The objection to these bottles is that they are too large for use in one day, and if kept longer the milk is likely to turn sour. Very little difficulty was experienced in inducing mothers to give up goats' milk. The only woman who persisted in using goats' milk, after being advised not to do so, and who was found to be getting it surreptitiously after it was forbidden in barracks, was, I am sorry to say, a Maltese woman, married to a non-commissioned officer of the Royal Army Medical Corps.

(5) Isolation of cases and disinfection of stools, soiled linen, clothes, &c.

Every case of enteritis was treated as an infectious disease. No other families were permitted to visit the house during the illness. Discharges were carefully disinfected, and all soiled clothing, napkins, &c., soaked in 5 per cent. izal solution before being washed. Mothers were instructed to wash their hands in izal solution after handling soiled clothes, cleaning the baby, &c.

The causes which propagate enteritis are generally held to be high atmospheric temperature, filth, insanitary surroundings, and improper feeding by the mother. Flies are also considered to play a large part in the spread of the disease. I am inclined to think that direct infection, that is, the spread of the disease from case to case, with or without the intervention of food, is the most common cause of the spread of the disease; and the fact that children fed on the breast alone get the disease, seems to me to prove that direct infection is, at all events, one of the causes of the spread of the disease. The prevention of enteritis is most important, as the disease, if recovered from, leaves a child very weak and unable to resist other diseases which it may contract, and in this way the mortality amongst children from all causes will be lowered. The following figures will bear me out in this contention.

DEATHS AMONGST CHILDREN FROM ALL CAUSES.

| | Imtarfa | Garrison excluding Imtarfa |
|---|---|---|
| 1905 | 11 | 46 |
| 1906 | *Nil* | 29 |
| 1907 | ,, | 25 |

Although the strength of the garrison was reduced in 1906, the number of women and children at Imtarfa has remained practically the same, for the following reasons. In 1906 the families belonging to the Sussex Regiment stationed in Crete were kept at Imtarfa, and in 1907 the married quarters at Imtarfa were kept filled up by families sent there, on the recommendation of the Principal Medical Officer, for change of air. It cannot be said, therefore, that the decrease of disease amongst the children was due to fewer children being there.

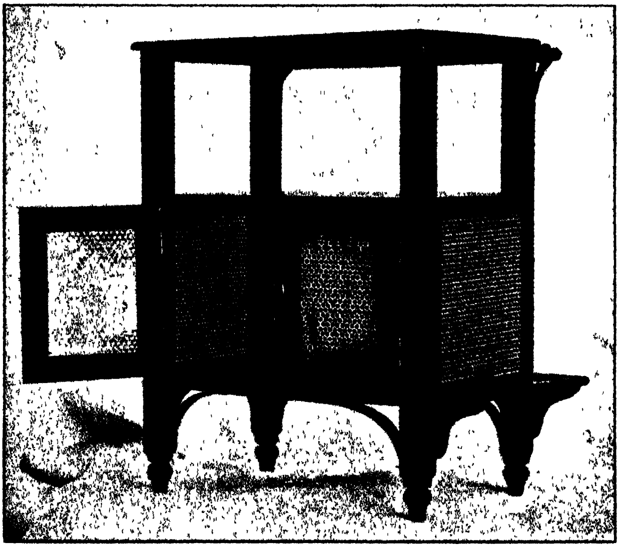
# A NEW PATTERN OF BEDSIDE TABLE FOR INDIA.

By Lieutenant-Colonel H. Carr.

*Royal Army Medical Corps.*

The following specification of a bedside table designed by Barrack Sergeant Hodgson, Nasirabad, may prove of interest to those who have been working in India, and had experience with the present unsatisfactory pattern.

The new model has been on trial here for some time, and has proved itself satisfactory in all respects. The accompanying photograph shows its general appearance.



Specification—frame, teakwood. Lower partition converted into a fly-proof cupboard by sides and folding doors of wire gauze. Upper partition open for patient's clothes. Table top, plain teak without iron binding. Mineral water bracket for two bottles at side next patient's bed. Towel-rail at back. Height of table 2 feet 9 inches; front (top) elevation 2 feet; end (top) elevation 1 foot 3 inches; cupboard space 1 foot 8 inches by 11¼ by 11¼ inches, clothing space 1 foot 8 inches by 11¼ by 10¼ inches.

The following are its chief advantages over the old pattern: (1) Fly-proof cupboard at bottom enables food to be kept clean and free from fly pollution. The present fragile unsatisfactory bread crock can be dispensed with. (2) The reduction in the large number of iron bands between which and the woodwork, dirt, bugs, &c., found lodgment. (3) The outside mineral water bracket places the bottles within easy reach of a sick man. (4) The provision of a towel-rail at the back.

The cost is a little less than that of the present pattern.

# Reviews.

ELECTRIC IONS AND THEIR USE IN MEDICINE. By Professor Stephane Leduc, Professor at the School of Medicine at Nantes. Translated by R. W. Mackenna, M.A., M.B.Edin., Physician to the Liverpool Skin Hospital, with an Appendix by the Translator. London: Rebman Limited, 1908. Price 2s. 6d. net.

Professor Stephane Leduc is a well-known authority on the subject of treatment by ions, and the practical results of his investigations, as presented in this excellent translation of his monograph by Dr. R. W. Mackenna, are of considerable interest and value. Since the day when Faraday first gave the name of "travellers" to the constituents of electrolytes set free at the electrodes by the passage of an electric current, the theory of electric ions has made much progress, and of recent years their application to practical medicine has opened up a field of great possibilities for future therapeutics.

In Section I. the laws of osmotic pressure are discussed, and their action in the phenomena of life explained. The remarks on cryoscopy are well expressed, but the subject—a most important one—occupies a very small part of the section. Although Van't Hoff's law is mentioned, we see no allusion to that of Raoult for concentrated solutions.

The section dealing with the ions is remarkably clear and well expressed. The chemical, toxic, antiseptic and remedial actions of the electrolytic substances are shown to be due to the action of their ions, and their significance in practical medicine is lucidly set forth.

As is probably well known, preparations of mercury and iodide of potassium, to have any real effect, are best given in locomotor ataxia by intramuscular injection, but the author goes further and states that if ataxia is recognised and treated by intramuscular injections of sublimate as soon as the first symptoms appear, the disease will be recovered from completely. He also states that it is more especially those cases of syphilis treated insufficiently in the beginning—slight cases which may not have been recognised or have been neglected—which produce locomotor ataxia.

In our Army at the present time, owing to the improved methods of treatment by intramuscular injection in the very earliest stages of syphilis, such cases of locomotor ataxia are hardly likely to occur, but the possibility has always to be borne in mind.

It is noted that the author does not agree with the view still held by many, that tabes is a parasyphilitic affection, and that specific treatment never cures, but always aggravates it. It is probable that the majority of physicians in this country are in accord with Dr. Leduc.

Dr. Leduc's method of treatment with sublimate is, instead of employing solutions of dilutions (1 in 100), to inject gradually five times as great a volume of a solution of 1 in 500 or ten times as great a volume of a solution of 1 in 1,000, as he points out that pain of the injection can be diminished by not allowing the ion Hg++ to act at the point of injection except under feeble concentration. He therefore injects into the muscles of the buttocks in the space of two minutes 5 to 10 cc. of a solution made up as follows:—

| | |
|---|---|
| Sublimate .. .. .. .. | 20 centigrammes. |
| Sodium chloride recrystallised .. | 1 gramme. |
| Distilled water .. .. .. | 100 grammes. |

The injection is practised bi-weekly.

In Sections III. and IV. the general theory of electricity, sources of electric currents, the electrolysis of living tissue, including the passage, penetration and speed of ions, are discussed in a masterly manner. Anyone unacquainted with the subject cannot fail to acquire a sound practical knowledge after careful perusal of these sections. There appears to be a certain reluctance among practitioners in this country to adopt the ionic treatment, partly, perhaps, because such treatment is considered to be costly or to require much apparatus, which is not the case. As Dr. Mackenna, the translator, points out in an admirable appendix on the technical application of the system, treatment with ions is within the reach of every practitioner who cares to use it, no expensive apparatus being required. All that is necessary can be procured by the outlay of a few pounds.

Sections V. and VI. are devoted to the consideration of treatment, with special reference to its use in certain diseases. They are especially interesting, as some of the author's own experiences and methods are given.

On the whole this monograph is a sound contribution, and will be acceptable to all interested in the ionic treatment of disease.

W. W. O. B.

HAY FEVER, HAY ASTHMA. BY William Lloyd, F.R.C.S. Second Edition. H. J. Glaisher. Price 4s. 6d.

The author holds that there are three factors in the causation of hay fever: (1) The presence of hyper-sensitive areas in the nasal mucous membranes; if accompanied by asthma, similar areas are detected in the pharynx. (2) A diseased, or at least an irritable condition of certain nerve centres, giving rise to symptoms in the nose itself, or in more or less distant parts, by reflex action. (3) The presence of pollen. The absence of any one of these factors is sufficient to prevent an attack. To detect the hyper-sensitive areas, a small piece of cotton-wool is twisted round the end of a probe and is dipped in a weak solution of silver nitrate or iodine. This is applied to the interior of the nose. Special attention is paid to elevated areas. If the irritation of certain spots brings on an attack of hay fever, these parts should be destroyed by the electric cautery or by chromic acid. He records twenty-five cases thus benefited. He does not relate his personal experience with pollantin, nor does he refer to Zarnicko's review of the results obtained with this remedy since 1905. Sixty-two per cent. of 492 patients treated with pollantin were relieved.

No mention is made of Schadle's observations. He claims to have shown that hay fever is often caused by catarrh of the antrum of Highmore. He has treated ninety-one cases by irrigating this cavity. Success was attained in nearly all. It would have been of interest to have had the author's opinion of such methods of treatment as have been advocated recently, viz., the local application of aristol, or of the continuous current and the resection of the nasal nerves.

C. B.

DISEASES OF THE SPINAL CORD. By R. T. Williamson, M.D., F.R.C.P. London: Henry Frowde and Hodder and Stoughton, 1908. Price 15s. net.

This book is based on lectures given by the author in the Manchester Medical School during the last fifteen years. It is divided into fourteen sections dealing with every aspect of disease of the spinal cord. Most of the nervous maladies of this nature are rare in military practice, but the section, on "Diseases in which Ataxia is a Prominent Symptom" has considerable interest for the military physician, as locomotor ataxia is not unfrequently met with in our military hospitals.

Erb's latest statistics in relation to the etiology of this malady are given by the author, and are worthy of quotation. They are "based on 1,100 cases of tabes in men in the upper classes of society: a history of syphilis was obtained in 89·45 per cent.; no history of syphilis could be obtained in 10·54 per cent.; 62·9 per cent. had presented definite secondary syphilitic symptoms, but 26·54 had a chancre only. In many cases in which no history of syphilis could be obtained there was a possibility of syphilitic infection, and in only 2·8 per cent. could the history be regarded as entirely negative, *i.e.*, as furnishing no evidence or suspicion of the possibility of previous infection."

The appendix on methods of pathological examinations of the spinal cord is particularly valuable to those of us who are, or hope to be, in charge of clinical laboratories, as it gives simple methods of preparing pathological specimens of the spinal cord. The methods given do not claim to be the best, but are those "which the writer has found convenient in his own pathological work, and they have been used in preparing the sections from which the illustrations in this book have been taken."

Judging from the excellent plates and woodcuts, with which the book is profusely illustrated, Dr. Williamson need not have been so modest in his claims.

The book is produced in the style now so familiar to readers of the "Oxford Medical Publications," and although it is not a work which is likely to prove of anything like daily interest to a considerable section of the officers of the Corps, it might well find a place amongst the works of reference in the larger military hospitals. R. J. B.

THE LAW IN GENERAL MEDICAL PRACTICE. By Stanley B. Atkinson, M.A., M.B., of the Inner Temple, Barrister-at-Law. London: Henry Frowde and Hodder and Stoughton, 1908.

This little book is declared to be "some chapters in everyday forensic medicine," and claims to supplement the ordinary instruction now given to students. We may say at the outset that it fully justifies these claims.

It is divided into eight chapters dealing with medical evidence, malpraxis and defamation, and medical practice in the coroner's court. There is a useful collection of difficult clinical occasions, and some eminently "practical cautions" for the young practitioner.

The law claims to be the most liberal of the professions, and its practitioners have frequently the gift of easy writing as well as ready speech on many subjects. Dr. Atkinson has certainly the gift of the ready writer in a marked degree, and we congratulate him on producing a book which is written in such graceful, easy English that it is a pleasure to read it. The culture of the author is evident in every page, and we have the dry dust of the law and the solemn atmosphere of the courts, into which the author brings us, frequently, but not too frequently, enlivened by a tag from Shakespeare or Scott, a motto from Schiller or Madame de Sévigné, a line from Gladstone or Browning, or a quip from "Gil Blas" or Dickens.

We do not recall ever having seen the position of the three great learned professions so well expressed as by Dr. Atkinson. He says: "The clergyman, the medical practitioner and the lawyer are mainly concerned respectively with the mind, body and the estate of those to whom they minister; the first has been said to see men at their best, the last to see men at their worst, whilst the medical adviser knows men as they are."

The author deals with the question of medical certificates in an able way, and we agree with him that it is desirable that the law with reference to the privilege of the medical practitioner should be better known by medical officials.

The book is suggestive rather than a guide, and the author concludes it by an excellent little bibliography. We note one curious omission in the list of difficult clinical occasions cited, viz., the legal position of an accoucheur attending cases of infectious disease.

The case of Crier v. Hope and Currie is fresh in all our memories. It was decided finally in the Court of Appeal just two years ago, and is of very special interest to the general practitioner, as the decision of the court has made the position of the physician-accoucheur who exercises all reasonable care a perfectly safe and secure one, whatever the nature of the infectious diseases which may occur in his practice.

We hope Dr. Atkinson will rectify this omission in the future editions of his excellent little book, which we sincerely hope an appreciative medical public will demand. R. J. B.

A CHRONOLOGY OF MEDICAL HISTORY. By James Young, M.D. Edward Everard, Bristol. Price 2s. 6d.

Dr. James Young's "Chronology of Medical History" is a small book of ninety-one pages, which gives, in a handy form for reference, short biographical notes of famous physicians and surgeons, the dates of notable discoveries in medicine and surgery, of the foundations of universities and colleges, of epidemics, and so on. Dr. Young has hit upon a good idea—he has provided an excellent scaffolding on which to build a knowledge of medical history. It is a pity, therefore, that he has allowed so many inaccuracies to appear in his book, many of which could have been avoided by careful correction of the proofs before the book was published, and by verification of references. In these pages there are many mis-spellings, thus Trousseau becomes Trosseau, Davaine appears as Davaines, and there are references to *voluminious* writers and *matura medica.* We also feel inclined to quarrel with Dr. Young owing to the numerous names we fail to discover in his work, and it is painful to an Army surgeon to note that not a few of those omitted were Army medical officers, and British ones at that. Where are Brocklesby, Sir John Pringle, John Freind, Sir James McGrigor, Henry Marshall, Robert Jackson, to name only half a dozen distinguished men who served as physicians or surgeons in our Army? We can also find no mention of Ricord, Helmholtz, Everard Home, Goodsir, Sir Henry Thompson, Hey, Lirfranc, Sharpey, O. W. Holmes, Sir B. W. Richardson, Stokes, of Dublin, and many others. But perhaps it is unfair to criticise Dr. Young too freely, for he acknowledges in his preface that his work is but an imperfect record, and, notwithstanding our strictures, we think no medical man will be able to read the book without learning something and without becoming interested. We look forward to a second and amended edition of the book. The study of medical history has only been too greatly neglected in the past, and we consider Dr. James Young deserves some commendation for his little contribution to that study.

H. A. L. H.

AIDS TO TROPICAL MEDICINE. By Gilbert E. Brooke, M.A., L.R.C.P. Baillière, Tindall and Cox.

There can be no doubt but that handbooks which contain concentrated knowledge in small bulk have their uses, and are, indeed, indispensable to those who, having no fixed abode, must provide themselves with a portable library. We therefore welcome the appearance of "Aids to Tropical Medicine," and predict that it will be widely read by officers of the Services. We venture to say that a second edition will be in early request, and would now draw attention to points which need revision. It is to be regretted that the author has not followed the Nomenclature of Diseases of the Royal College of Physicians; such unfamiliar terms as "diathermasia" for "heatstroke" and "phœbism" for "sunstroke" would not then meet our eyes. He states the former never occurs in Europe nor at an altitude higher than 600 feet. Both statements are inaccurate. In the treatment of ankylostomiasis the use of beta-naphthol in 15-grain doses or of eucalyptus oil in 30-minim doses might have been noted. The resemblance of scurvy in some of its forms to beri-beri is not mentioned. There was no need for a separate heading "Epidemic Dropsy," since there is no evidence that this disease is not beri-beri. The proportion of bilharzial infections in which urethral fistulæ and sinuses are stated to exist (20 to 30 per cent.) is too high. These complications are practically non-existent among the numerous men who contracted the disease in South Africa. Male fern, which he advocates as routine treatment, is greatly over-estimated. Bladder irrigation, which he recommends, is to be deprecated; no good results therefrom. The results of anti-cholera inoculation should be described as more than "fairly satisfactory." In India the incidence and mortality in the inoculated is diminished to one-seventh of that which prevails in the uninoculated. Zabolotny's St. Petersburg figures are still more favourable. He dealt with 12,000 non-inoculated and 5,887 inoculated. The incidence of cholera was reduced by inoculation from 46 per 1,000 to 1 per 1,000, and the mortality from 26 per 1,000 to 0·5 per 1,000. It is clear, therefore, there are few such life-saving measures as this in the whole range of medical and surgical practice. The characteristics given are not sufficient to identify Shiga's dysentery bacillus. In the account of liver abscess stress is not laid on the bacteriological examination of the pus. If this be sterile, aspiration, with injection of quinine solution into the cavity, may be all that will be necessary. If the abscess is drained, there is no surgical procedure in which asepsis is of more vital importance. A sterile liver abscess, if kept sterile, no matter what size, will dry up in a fortnight or three weeks. Cases are lost, in the large majority of instances, by a secondary invasion of the cavity with pyogenic organisms. The death-rate in infectious jaundice is given as from 10 to 60 per cent.; this is too high. In the epidemics which attacked our troops during the South African War the mortality was almost *nil.* The treatment of ulcerating granuloma of the pudenda by X-rays has been omitted; this method has given the best results. The formula inserted of what the author designates "Schaudinn's syphilis stain" is that of the fluid more commonly known as "Giemsa's staining solution." It is of the greatest value in blood examinations in the Tropics, since it undergoes less deterioration by heat and age than some other forms of Romanowsky's stain. The treatment of leprosy with "leprolin" has been discredited, since the bacillus which is used in its preparation is not the leprosy bacillus. Snake-bites are not included, nor Tumbu-fly disease, which is of frequent occurrence on the West Coast of Africa. There is considerable room for improvement in the illustrations, some of which are misleading. The Leishman body is figured in the interior of a red blood corpuscle, a situation where it is not found.

We cannot conclude without paying due tribute to the immense amount of exact and invaluable information which has been compressed into small space, and after adequate revision we have no hesitation in saying that "Aids to Tropical Medicine" will prove to be a most useful book in the possession of the physician residing in a tropical or subtropical climate. C. B.

THE HYGIENE OF FRENCH BARRACKS. AN HISTORICAL STUDY. (L'Hygiène du Casernement français. Etude historique). By J. Lambert des Cilleuls. Pp. 88. 10 inches by 6 inches. Lyons: Rey, 1907.

This pamphlet is a thesis written by a student at the Army Medical School, Lyons, for his doctorate in medicine. It is of interest in giving details and facts connected with the general development of hygiene in the French army from the earliest days to the present time. The author considers that there were three periods in the evolution of hygienic principles in barrack construction. The first period was the seventeenth century, when soldiers were first placed in barracks instead of being billeted on the people. The illustrious engineer, Vauban, was concerned then in the construction of barracks, and appears to have effected several reforms by his criticisms of the manner in which soldiers were housed. Amongst some of the provisions laid down at that time was the necessity of having beds large enough for two soldiers to sleep in. The second period was the eighteenth century and first quarter of the nineteenth century. It is a period in which military hygienists began to make their voice heard with sufficient authority to influence the acts of Government. In the third period, which followed, the general sanitary condition and construction of barracks were reorganised in accordance with more modern scientific knowledge of the causes and prevention of disease, and by the persistent efforts of military and civil medical men and engineers. The pamphlet is useful, as a work of reference, to those interested in the history of barrack construction in France.

W. G. M.

International and National Measures for the Prevention of Disease. (Prophylaxie internationale et nationale.) By Dr. Paul Faivre. Pp. 195, 18 figures in text. 9¾ inches by 6¾ inches. Paris: Baillière et fils, 1908. 4s.

As a work of reference this volume will be found of considerable use. It brings within a small compass much of the information one wants to have at hand concerning the various international sanitary treaties and conferences, the subjects discussed and the legislation introduced in connection with them, and the international boards of health at Constantinople, Egypt, Tangier and Teheran. The sanitary defence of the Red Sea, the Mecca pilgrimages and Persian Gulf are illustrated by a useful little map. The second part of the volume, occupying about two-thirds of the space, is concerned with quarantine administration, and measures applied in France to prevent epidemics entering by its seaports or land frontiers. It details the regulations in force, the organisation of the port health officers, the measures adopted in dealing with the arrival and departure of vessels, the destruction of ship's rats, methods of dealing with merchandise, quarantine hospitals, disinfection and other matters. There is also an account of the special measures adopted to prevent the spread of cholera in France during the epidemics in Finisterre in 1885-6, in Spain in 1890, and in France and Germany in 1892; along with an account of the quarantine posts along the land frontiers on the north and east of France. This part of the volume contains some plans and photographs of quarantine stations in France, apparatus for disinfecting ships, and other details.

W. G. M.

Soldiers' Rations: Theoretical and Practical Notes for the Use of Officers. (L'Alimentation du Soldat.) By Med. Major Barthélemy. Pp. 58, 3 tables appended. 7¼ inches by 4¾ inches. Paris: Maloine, 1908. 1s.

This little book gives a very clear and excellent account of the scientific and practical bearings of the question of soldiers' rations in five chapters. The first deals with the usual scientific facts connected with the nature and quality of rations and the amount of calories required for different forms of work; the second, with various practical matters connected with the preparation of rations in barracks, arrangement of menus, cooking and varying the different meals. Chapter III. is a short reply to certain objections raised to the author's views on the subject of rations in barracks. Chapter IV. deals with rations on manœuvres and in the field. The remarks on wheeled-kitchens are to the effect that the advantages of these kitchens compensate for their disadvantages, but, as they may be captured by the enemy, the soldier should continue to carry a mess-tin and learn to cook his own food. The last chapter enters into some details concerning the examination of different articles of food, such as fish and tinned meat and salt pork.

W. G. M.

# Current Literature.

**Supervision of Water Supplies in the French Army.**—(*Bull. Off. du Service de Sante*, May 20th, 1908.) By circular of December 25th, 1907, and decree of March 13th, 1908, a higher advisory council and local hygienic boards are nominated for the supervision of water supplies in the Army.

The higher advisory council is to consist of three *ex-officio members*, namely: The president of the advisory board on military hygiene and epidemiology (*Commission Superieure consultative d'hygiène et d'épidémiologie militaires*); the director of engineer services at the War Office; and the director of medical services at the War Office. Four *members of the Senate*. Five *members of the Chamber of Deputies*, namely: The president of the committee on hygiene of the chamber; the director of hydraulics and agricultural improvements in the ministry of agriculture; and three others, one of whom is a geologist and a member of the advisory committee on public health of the geological survey. One chemist, namely, the chief of the laboratory of the advisory committee on public health. Two bacteriologists, namely: the chief of the bacteriological service at Montsouris; and the professor of hygiene at the University of Lyons, and four *military members*, namely, M. Delorme, Inspector General, Army Medical Service; the professor of hygiene, Val-de-Grâce; the professor of epidemiology, Val-de-Grâce; and the chief pharmacist officer of the Army.

These members are nominated for three years, with power of extension. The Council elects its own president and secretary. The duties of the Council are: (1) To draw up a form of water examination as a guide to the local military hygienic boards; (2) to determine the necessity of installing special means of purification in different localities, and the method that is to be adopted in each case; (3) to advise on proposed agreements with municipalities; (4) to examine proposals for the collection and distribution of water supplies; (5) to examine the annual reports from local hygienic boards and decide on what improvements are necessary; (6) to report upon all proposals connected with water supplies that are made by local hygienic boards, or that are submitted to them by the Minister of War.

The local hygienic boards are boards formed in each garrison, and consist of five members, namely, an engineer officer, an intendance official, an army medical officer, and two civilians selected on account of their expert knowledge of chemistry and bacteriology. They are appointed by the general officers commanding army corps and hold the appointment for three years, with power of extension. Their duties are: (1) To collect and forward water supplies for examination; (2) to study the topographical and geological conditions necessary to trace water supplies to their source; their immediate or remote possibilities of contamination and the extent to which collecting areas should be protected, &c.; (3) to study the influence of season and rains on the amount and purity of the water; (4) to determine the variations that occur in the temperature of the water according to season, rains, &c.; (5) to control the different installations for purifying water in garrisons; (6) to watch for any damage in conduits, reservoirs, &c., and other changes that may introduce an element of danger; (7) to report immediately to the local military authorities any preventive measures that may be necessary; (8) to carry on any experiments that the higher advisory council may require; (9) to carry on negotiations when necessary with municipal authorities, or departmental hygienic and sanitary councils.

The local hygienic board must submit an annual report on July 1st to the War Office (Medical Department). W. G. M.

**Reduction of Military Apothecaries in France.**—(*Le Caducée*, March 21st, 1908, and June 20th, 1908.) The proposal of the military budget to reduce or abolish the military pharmacist in France has created much excitement in the military medical service. *Le Caducée* says that if the military pharmacist is abolished the next step in economy will be to abolish the military medical officer.

In connection with the above proposal of the French Minister of War, Surgeon-General Villaret, of the German Army, an officer who holds the post of Inspector of Medical Services for the Berlin Inspectorate, has written an article in support of the retention of military pharmacist officers in modern armies, and on the inconveniences that will arise from their suppression. The only point which he makes is, that while the French Army has eighty-five pharmacist officers on its peace establishment, the German Army has only forty-nine for a strength that is greater than the French Army. These forty-nine pharmacist officers in Germany are distributed as follows: One pharmacist with the rank of Lieutenant-Colonel attached to the headquarters staff at the War Office, twenty-three pharmacists with the rank of Major attached to the office of Principal Medical Officers of Army Corps, twenty-five Surgeon-Captains attached to the large military hospitals at the headquarters of the Army Corps.

W. G. M.

**Advisory Board in France for Military Hygiene and Epidemiology.**—(*Le Caducée*, April 4th, 1908.) The "Commission Superieure d'Hygiène et Epidemiologie Militaires" is composed of twenty members, namely: The Director-General of the Army Medical Service *ex-officio;* nineteen members nominated by the Minister of War, viz., one senator (Dr. Labbé), one deputy (Dr. Villejean), nine civilian doctors, chosen from amongst members of the Academy of Medicine, seven military medical officers from amongst surgeons-general on the active or retired list, one general officer of engineers.

W. G. M.

**Army Medical Equipment for Anæsthesia in Field and Peace Service.**—(*Deutsche Militärärztliche Zeitschrift*, June 5th, 1908, p. 480.) An interesting discussion on the subject of anæsthetics in military medical service was held at a meeting of the Scientific Committee in the Kaiser Wilhelm Akademie in April last. An abstract of the proceedings is published in the *Deutsche Militärärztliche Zeitschrift* of June 5th, 1908. Many well-known army medical officers, including Schjerning and Stechow, and University Professors took part in the discussion. Amongst the latter are the names of Bier, Czerny, v. Eiselberg, Köhler, König, Krause, Kümmell, Küttner, Rehn, Sonnenberg and Trendelenburg.

With regard to local anæsthesia, Krause recommends eucaine B. in 1 per cent. normal salt solution without the addition of adrenalin. Bier recommends the adoption of novocaine "tabloids" for hypodermic injection, consisting of novocaine 0·5 gramme, sod. chlor. 0·6 gramme, adrenalin hydrochlor. 0·001 gramme, to be dissolved in 100 c.cm. distilled water, or, in the case of injury to the main nerve trunks, in 50 c.cm. water. The use of scopolamin-morphia for anæsthesia was considered unnecessary; and cocaine might also be carried in lesser quantities.

As regards anæsthesia by inhalation, ether was universally recommended for use in the first line. It was recommended that it be carried in 50 c.cm. flasks, but it has yet to be proved whether, from the point of view of weight, space, and danger from fire or explosion, it can be taken in the regimental medical carts. Droppers are recommended by Bier for both chloroform and ether inhalation, in place of the anæsthesia apparatus in general use, which can very well be dispensed with on field service.

As regards spinal analgesia, Czerny, v. Eiselsberg, Köhler and Rehn declared that this was unsuited for use in the field. Others, such as Kuster, Sonnenberg and Bier, strongly recommended it for use in the field hospitals and lines of communication, Bier specially pointed out that the material required was more easily carried than material for anæsthesia by inhalation, and recommended the use of aseptic "tabloids" of 0·5 gramme tropacocaine, with 0·0001 of adrenalin hydrochlor. the "tabloids" to be carried in the hypodermic syringes. They would be dissolved in the cerebro-spinal fluid drawn into the syringe. The keeping powers both of these "tabloids" and of the novocaine "tabloids" require investigation.

Finally, it was recommended that in peace time medical officers should be constantly practised in using the anæsthetic material that would be used in war, and adrenalin preparations should be introduced into the list of drugs supplied to garrison hospitals. W. G. M.

**First Field Dressings of Different Countries.**—(*Deutsche Militärärztliche Zeitschrift* (11), 1908, p. 457.) Oberstabsarzt Dr. Blau, of the German medical service, has been studying the question of the field dressings of different countries, and has published articles on the subject in the *Deutsche Militärarztliche Zeitschrift* and in the *Militär Wochenblatt*. In the former he gives useful tables of reference, detailing the nature of the outside covering, size, weight, method of stitching inner covering, details of the dressing itself, directions for using, method of carrying, and source of supply of the first field dressings of twenty nationalities. Many of these details are, of course, of value only for the purpose of reference and comparison, but one or two points are of interest. For example, the weight of the different packages varies very considerably from 21 grammes in Norway to 130 grammes in America. The British dressing is shown as 40 grammes, and this is the weight, too, of the German (naval), Turkish and Netherlands dressing, while the Austrian dressing (37 grammes) and the Russian dressing (42 grammes) are also nearly the same weight. The German army has a dressing of 28 grammes in weight, but two such dressings are carried, so that the complete equipment of first field dressing is equal to 56 grammes. The French is 59 grammes in weight.

The coverings vary very considerably, from metal to paper. In all, the principle of keeping the dressing waterproof and preventing the entrance of dust or dirt has been aimed at, although it is evident from various reports that this object has not always been attained. Dr. Blau, for example, quotes the observation of Laval to the effect that he was surprised in opening a first field dressing of a foreign army to find a number of maggots within the impermeable cover, although the parchment envelope was intact. In most cases the coverings are double, it is single only in Germany and Norway, in Belgium and Russia there are three coverings.

Some dressings are prepared as aseptic dressings, others contain antiseptic material, the German, Russian, Swedish, Italian, Norwegian, Belgium and Japanese are impregnated with mercuric chloride, the Austrian and the Swiss with vioform, the Netherlands dressing is a type of purely aseptic dressing. In some the dressing is first of all impregnated with antiseptic and subsequently sterilised by steam. The method of carrying the dressing is practically the same in all countries, namely, in a special pocket of the tunic. In America, however, it is carried attached to the waist-belt.

The point, however, that seems to be worthy of most consideration now is the tendency to alter the old form of dressings into a simple gauze bandage with a piece of gauze dressing material, or compress stitched to it in such a way that the soldier, stretcher-bearer or individual applying it need not touch the part of the dressing that is placed directly over the wound with his fingers. This form of dressing has already been adopted in the German army, in the Netherlands army, in the Austrian army and the United States. The original difficulty in connection with dressing of this kind was that it limited the application of the dressing to one wound only. In Germany this difficulty has been overcome by issuing two packages to each man, in the United States by including two of the bandages with compresses stitched to them in each package, and in Holland by using two packages so joined together that they form one package so far as their carriage is concerned, but two separate packages so far as their use is concerned. This last method is worthy of note, as if one wound only has to be covered, the remaining dressing remains untouched within its outer envelope. At the same time there is also much to be said in favour of the German method of having the two packages separate. There seems to be nothing in favour of the American method of having them both in one case, because if one wound only has to be covered the second dressing in the case has practically to be thrown away.

Laval has also been publishing articles on the first field dressings of different armies in *La Caducée*, commencing with the first field dressing of the Netherlands army, which he describes as realising all the requirements of such a dressing. These articles were commenced on January 19th, 1900, and are being continued from time to time.

W. G. M.

**Personal Experiences during the Russo-Japanese War.**—Surgeon-Colonel Haga, of the Japanese Army, who was Principal Medical Officer of the 5th Division during the Russo-Japanese War, read a paper, which is published in the *Deutsche Militärärztliche Zeitschrift* of May 20th, 1908, before the Kaiser Wilhelms-Akedemie, in Berlin, on his personal experiences during the war.

Dr. Haga was present with his division at the battles of Teh-li-ssu, Tashichiao, Liaoyang, Shaho, Heikoutai, and Mukden. In addition to the medical service with regimental units he had under him one bearer battalion, and five field hospitals. The regimental medical service had two medical officers, and four or five men of the medical corps, with each battalion, together with four stretcher-bearers to each company. The junior medical officer was ordered to open a first aid station in the fighting line, while the senior medical officer along with the men of the medical corps opened a battalion dressing station about 500 or 600 metres behind the line. The open formation in attack, by which a battalion advanced on a front of 1,000 metres, added greatly to the difficulties of the medical service with combatant units. This was avoided to some extent by making the stretcher-bearers follow the fighting line in extended order of two bearers and a stretcher at intervals of 200 metres. The main dressing station was opened by the divisional bearer battalion within half hour to one hour after an action commenced. The medical service was always informed beforehand of the intention to attack, and everything was consequently ready for rapidly opening the dressing station. The orders to open or to advance were invariably given by the General Commanding the Division, on the proposals of the Principal Medical Officer. The bearer companies of the battalion as a rule carried 80 stretchers, but had no ambulance waggons. Chinese country carts were frequently used, however, to evacuate from the main dressing station to the field hospitals. They could not be used further in advance on account of the ease with which they would be seen by the enemy. In fact, Dr Haga's general impression is that the use of waggons on the field of action during a battle must be classed amongst those things that are impossible (*Zu den Unmöglichkeiten gehört*).

It happened, that in certain areas of fighting in the battles of Liaoyang and Mukden, it was impossible for the stretcher-bearers even to creep along to the dressing stations, and it was only during night that they could bring the much-required help to the wounded. One division that was alongside the 5th Division main dressing station came under such heavy fire, that a third of its *personnel* was put out of action and it had to suspend work. The bearer company of Dr. Haga's division had a petroleum lamp, but it was very seldom used, because as soon as its light was visible it drew fire from the enemy. The men managed to keep their direction very accurately, either by means of a compass or by the stars, and searched for wounded and brought them back in darkness.

As regards the surgical work at the main dressing station, Dr. Haga considers that very few operations can be undertaken there, and that the chief duty is the application of dressings. He mentions the arrest of hæmorrhage and tracheotomy as the operations that should be carried out, although even tracheotomy, he considers, is not nearly so often necessary as formerly in wounds of small calibre bullets.

Although the field hospitals were 1,000 to 2,000 metres behind the fighting line, they were not actually free from artillery fire. Occasionally a field hospital was opened in the same village as the main dressing station, and in that case the dressing station ceased to work, the wounded being brought direct from the field to the field hospital. One of the objects for bringing the field hospital so far forward was to enable the stretcher-bearers of the bearer battalion to be employed in as large a number as possible in the front fighting line. Dr. Haga avoided dividing the field hospital into sections as much as possible, because he found that its efficiency was greatly impeded by separating it into two sections. It was, however, impossible to avoid this at Liaoyang and Mukden, because of the exceptionally large number of wounded, and the necessity of sending one-half of a field hospital on with the advancing army while the other half remained behind with the wounded until it could be set free by the arrival of a clearing hospital, or by evacuating the wounded to the lines of communication by its own resources. The acetylene lamp was found useful for surgical operation work in the field hospitals.

The Japanese field hospitals are equipped for 200 wounded, but during the winter campaign enough material for 1,000 wounded was carried by the help of Chinese country carts, and it was by the use of these country carts that the field hospitals were able of themselves to evacuate the slighter cases of wounds to the line of communication. The sick and wounded transport unit was not sufficient in itself to do this, and to it was left, usually, only the evacuation of the serious cases, generally by means of hand carried stretchers. The stretchers were carried by the class of soldiers known as auxiliary soldiers or labourers. The 5th Division was too far from the railway in Manchuria to enable evacuation to be made by railway trains.

The battle of Heikautai (San-De-Pu) was fought in a snowstorm, and the men had the very greatest difficulty in marching; the mass of snow that clung to their boots had to be hacked away with bayonets. They were very heavily clothed with a heavy fur coat and a full pack, so that each man carried about 70 lb. (32 kilogrammes), or more than one-half of his own weight. The cold was intense, falling to about 14° below zero, Fahrenheit. In spite of this only those who went to sleep suffered from frost-bite, but they suffered even if they slept for a few minutes only. The condition that predisposed most to frost-bite was wet, and this occurred partly through perspiration of the feet and partly through the melted snow soaking through the soles of the boots. One could see distinctly ice forming on the stockings. In order to prevent frost-bite amongst the wounded attempts were made to bring them as quickly as possible under cover. Each stretcher had a cloth cover that was a considerable protection against the biting cold, and a woollen blanket was also supplied to each stretcher. At no time was the clothing removed in order to examine the wound, only in the immediate neighbourhood of the wound was any cloth cut away. Complete examination and dressing were only carried out in the field hospital. During this battle biscuits were given for food and snow for drink. Anything that was in the water-bottle froze.

As regards losses, the 5th Division had three medical officers and several men of the medical corps and stretcher-bearers killed. All were under the same exposure to fire as the combatants. In the total list of casualties of officers of all branches of the service throughout the army the infantry lost most, then the artillery, engineers, army medical service and cavalry.

All corpses were burned after the battle. Dr. Haga's Division lost altogether 11,302 killed and wounded. Of the former 2,190 were killed outright on the battlefield, and 290 died later of wounds, the remainder were evacuated to the line of communication and recovered. The casualties from rifle fire were 9,559, of which number 1,955 were killed on the field and 269 died later of wounds. Amongst those who were killed outright the percentage of wounds in the different anatomical regions was as follows: Head and neck 54·02, trunk 44·45, upper extremity 0·66, lower extremity 0·86. It is thus seen that wounds of the head and neck account for more than half of the men who were killed; the fatal wounds of the trunk were due to wounds of the heart and large vessels; very few wounds of the extremities were fatal on account of hæmorrhage. Although the number of injuries to the large blood-vessels by modern bullets has considerably increased, both the wounds of entrance and exit are very small, and seldom show any severe bleeding externally. Of the cases who died subsequently of wounds Dr. Haga gives the following percentages: Head and neck 32·34, trunk 64·68, upper extremity *nil*, lower extremity 2·93. The high percentage of deaths from wounds of the trunk is chiefly due to wounds of the abdomen. Wounds by artillery fire, of which 1,609 occurred, were immediately fatal in the following percentages: Head and neck 59·09, trunk 34·55, upper extremity 0·45, lower extremity 4·91. Amongst those who died later from artillery wounds, there were 55·00 per cent. wounded in the head and neck, 20·00 in the trunk, none in the upper extremity, and 25·00 in the lower extremity. In these percentages Dr. Haga includes amongst the men who were killed outright on the battlefield, all those who died in the main dressing station, only those who were eventually admitted to the field hospital being included amongst the cases who died later of wounds.

The proportion of killed to wounded is as 21·2 to 78·8, that is, of all wounds 21·2 per cent. died or were killed outright, and 78·8 survived. The proportion of total casualties, namely, killed and wounded to total strength of the combatants was 34·89 per cent. or somewhat more than one third; of these 98·67 were due to rifle fire, 9·67 to artillery fire, 0·16 to bayonet or sword wounds, and 0·48 to other missiles. For every officer killed twenty-four men were killed, and for every officer wounded twenty-eight men were wounded. The casualties in infantry regiments varied in the battle of Liaoyang from 32·10 to 46·64 per cent., in the Shaho from 14·09 to 19·10, and in the battle of Mukden from 58·48 to 71·89. In one regiment the regimental commander and all the officers were either killed or wounded, and in this regiment one soldier was found in the firing line with 200 wounds.

Dr. Haga concludes with a few remarks concerning surgical operations, and says that as regards wounds of the skull all fragments must be removed with exception of those splinters that have penetrated deep, that the wound must be kept open in order to prevent the development of brain abscesses, and that perforating graze wounds give the best prognosis. In some cases where the bullet remained in the brain, as was shown by Röntgen rays examination, the patients recovered. As regards laparotomy, he says that this was not undertaken partly because it was undesirable to perform the operation and partly because there was no time to do so. Many cases recovered by conservative treatment, although peritoneal complications were undoubtedly present. As regards laparotomy, the condition of affairs in the field army in Manchuria was quite different from that of the army in front of Port Arthur, where the field hospitals were more stationary, and where, in consequence, laparotomy could be carried out, and was carried out in a considerable number of cases. Dr. Haga, however, says that he was informed by Dr. Tsuruda that the results were seldom favourable. Wounds from hand grenades were terribly destructive, they were extremely common in Port Arthur, but only rarely observed in the battles in Manchuria.

As regards sick, 8,157 were received into the hospitals, and of these 384 died, the death-rate being equal to 4·7 per cent. of the admissions and 1·1 per cent. of the fighting strength. Among the cases there were 715 of enteric fever, or 8·76 per cent. of the total admissions. There were sixty-eight cases of dysentery, or 0·83 per cent. of the total admissions. The number of cases of beri-beri was 1,723. The case mortality of infectious diseases was extremely high, 34·69 per cent. of the enteric fever cases and 38·52 of the dysentery cases died.

Dr. Haga concludes his notes with the following words: "The medical arrangements of our Army have proved to be thoroughly sound, although one must also acknowledge that here and there improvements and increase in establishment are necessary. I make this statement all the more readily because we have based our army medical units on the model of those of the German Army. We owe, therefore, above all to the army medical service of Germany the exceptional results, which, without boasting, our army medical service in the Russo-Japanese War can claim to have achieved." W. G. M.

# Correspondence.

## A CONTRAST.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—When travelling on leave the other day in an island not a thousand miles from India, I met a young gentleman who sat at my table during dinner, and who had recently got over a severe attack of enteric fever in a big civil hospital in the large seaport town of the island. He still looked ill, but his appetite was apparently not impaired, as he took every article on the *menu*, some of which were anything but digestible and must have done him considerable harm. After dinner he informed me that he had been convalescent for six weeks, having been free from fever for a month before he was discharged from hospital, and had now been out of hospital for a fortnight. He told me he had not been told to be careful of his diet when convalescent, nor had he been told that he might be still infective, and how to avoid infecting others, in fact, he was absolutely ignorant of his disease.

Now on the other side take the Army, and I will describe what precautions are taken at this station and other stations in India. A patient, when convalescent, whether an officer or man, is told all about his disease, and the danger of infecting others, and how to avoid this. When convalescent he is sent to the Enteric Convalescent Camp, now kept in all stations ; here he stays a varying time whilst his excreta and urine are frequently examined for *Bacillus typhosus* and the paratyphoids. After about six weeks to two months there, and if found fit, he goes back to his regiment or else to a Hill station. A scheme is now on to form enteric camps near certain Hill stations, where convalescent enteric cases will be sent and also enteric carriers ; these camps will be in command of an officer, who himself has had enteric fever, and the men will do their ordinary work such as firing, &c., strict sanitation will be observed, and the men kept to themselves and away from other troops as much as possible. A medical officer will examine the patients frequently, and if they are found free from infection will send them back to their regiments.

I am, Sir,

*Station Hospital, Secunderabad,*
*June 6th*, 1908.

J. H. Douglass,
*Captain, R.A.M.C.*

## STUDY OF TROPICAL MEDICINE.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

I beg to call your attention to the new course of instruction which will be given to the students of the Liverpool School of Tropical Medicine at the University of Liverpool, after the beginning of next year. For a considerable period the teachers of the School have reported to the Committee of the School that the time allotted for the course of instruction, namely, the academical term, or about ten weeks, was insufficient to give a complete curriculum on the subject, especially as, owing to the recent numerous great advances in our knowledge of tropical medicine, the subject had been very much enlarged of late. The School, therefore, has determined to add three weeks to the ten weeks period of study, and the University has decided to give its diploma in tropical medicine only to students who had undergone this course of thirteen weeks. It is hoped that this change will result in still more complete instruction, and a still more valuable diploma.

Owing, however, to the lengthened term, it will not be possible to give more than two such courses every year, and the courses have therefore been fixed to begin on January 6th and September 15th, every year. The corresponding examinations for the diploma being held thirteen weeks later, that is to say, about April 5th and December 13th, respectively.

In addition, however, to these two full courses, the School has arranged to introduce an innovation, in the form of a short course lasting only one month, for practical instruction in tropical pathology and medical entomology, to be given from June 1st to 29th every year. It is hoped that this will be of the greatest utility to medical men returning on short leave to England, as it will enable them to acquire the practical technique of microscopic and similar work, which has been much desired by many of them. After the four weeks short course, a class examination will be held, and a certificate will excuse for the first four weeks of the full Lent and autumn courses.

The University and the School desire to have this information regarding the changes referred to spread as widely as possible for the use of medical men in the Tropics; and I am therefore to request you, Sir, to be kind enough to give some notice of it in your valuable periodical.

I am, yours faithfully,
ALFRED L. JONES, *Chairman.*

## DISPOSAL OF MEDICAL SERVICES DURING OPERATIONS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

DEAR SIR, — The Director-General is anxious that we should be exercised in duties in the field, and the headquarters of the brigade to which I am attached have received instructions to allot some definite medical unit (imaginary) to one of the sides in the operations carried out by its brigade. We have to furnish brief reports stating how we would dispose of the medical services during the phases of the operations, and they are forwarded to the headquarters of the division for criticism.

I wonder if some senior officer would write a paper to the Journal, giving the juniors some ideas as to how this important subject should be approached?

The brigade staff, though quite willing to help, is hardly as fitted to advise us as our own senior officers would be. Perhaps before the next manœuvres some enterprising officer would publish a small book on this subject.

I am, &c.,
F. J. PORTER,
*Major, R.A.M.C.*

*Camp, Godshill Ridge,*
*August 20th,* 1908.

VOLUME XI. OCTOBER, 1908. No. 4.

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of the

Royal Army Medical Corps.

# Original Communications.

## THIRD REPORT ON EXPERIMENTS IN CONNECTION WITH ANTI-TYPHOID VACCINE.[1]

BY BREVET-LIEUTENANT-COLONEL W. B. LEISHMAN,
MAJOR W. S. HARRISON, MAJOR H. W. GRATTAN,
CAPTAIN A. L. A. WEBB, AND CAPTAIN J. C. KENNEDY.
*Royal Army Medical Corps.*

(1) To ascertain the influence on the phagocytosis of typhoid bacilli, in the presence of a heated normal serum, when using as a test organism, first, a non-virulent strain of *Bacillus typhosus*, second, a freshly isolated and virulent strain.

These experiments were undertaken for the purpose of investigating the discrepant results which had been obtained by ourselves and by Dr. G. Dean, of the Lister Institute. As may be seen from our former reports, we obtained, in almost all cases, higher readings, in respect of the phagocytic activity of the polynuclears, when the normal serum had been heated to 60° C. for half an hour, than when the same serum was added to the washed cells without preliminary heating. This led to the abandonment of our attempt, in the Aldershot work, to measure the fluctuations in the typhoid opsonins by the method usually adopted for the demonstration of these substances. Dr. Dean, on the other hand, had found consistently higher phagocytosis before heating than after. He was good enough to give us the benefit of his experience in the matter, and his suggestion that the cause of the discrepancy of our results might lie in the fact that we employed different strains of typhoid bacilli in our respective experiments proved to be correct. For the purpose of testing this point we exchanged cultures, with the result that, working with our strain, Dr. Dean obtained results identical with those which we had recorded, while we, on our part, were able to confirm Dr. Dean's work when using the strain which he was in the habit of employing.

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[1] Previous reports on this subject were published in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS in the numbers for May, 1907, and June, 1908.

Our tests had always been carried out with an old laboratory strain, to which there remained little virulence; on the other hand, Dr. Dean's strain had been recently isolated from a case of enteric fever, and was found to possess a high degree of virulence for guinea-pigs.

As an example of the results of the experiments which we conducted on this point, the following may be quoted:—

Two strains were employed, one, "G," being an old strain, which required an intra-peritoneal dose of 5 cc. of a twenty-four hours' broth culture to kill a guinea-pig; the other, "K," had been recently isolated from the blood of a case which terminated fatally, and was lethal to guinea-pigs in a dose of ·5 cc.

A sample of serum, taken from a normal rabbit, was divided into two parts, one of which was heated at 60° C. for half an hour, the other portion being unheated. Phagocytic estimations were then made with each strain of *B. typhosus*, the number of bacteria ingested by fifty polynuclear leucocytes being recorded in each instance, with the following result:—

| | No. of bacteria in 50 cells. |
|---|---|
| *A. Phagocytosis of Strain "G."* | |
| Unheated serum.. .. .. .. .. .. | 600 |
| Serum after heating at 60° C. .. .. .. .. | 838 |
| *B. Phagocytosis of Strain "K."* | |
| Unheated serum.. .. .. .. .. .. | 379 |
| Serum after heating at 60° C. .. .. .. .. | 80 |

(2) To ascertain the degree of bactericidal action of normal saline solution upon *B. typhosus*.

This question was raised in connection with the method recently advocated by Klien[1] for the quantitative measurement of the bactericidal power of a serum. The dilutions of the serum in this method are made with normal saline, and, in the higher ones, it appeared to us that the well-known bactericidal action of salt solution might vitiate the results.

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[1] *Johns Hopkins Bulletin*, vol. xviii., p. 245, 1907.

A series of capillary tubes were accurately graduated with mercury, and, after sterilisation, 20 c.mm of a 1-10,000 dilution of a twenty-four hours' broth culture of strain "G" were drawn up into five of these tubes. One was blown out at once on to an agar plate, to serve as a control, while the remaining four tubes were incubated at 37° C. and blown out on to agar plates after various periods, ranging from three-quarters of an hour to three hours. In each case the plates were found to be sterile, while the control tube, in which the contact with the diluting salt solution had only been a few minutes, showed about 150 colonies.

Bearing in mind the importance of the virulence and age of the strain, as shown in the former experiment, this experiment was repeated, with the difference that a virulent strain "D.1" was substituted for the non-virulent "G." In this case the dilution employed was 1-6,300 of a broth culture, and the tubes were blown on to the agar plates at intervals from half an hour to three-and-a-half hours. The results were the same as with the non-virulent culture; all of the tubes which had been incubated proved sterile, while the control tube, when plated on the agar, yielded about 400 colonies.

As it appeared possible that the bactericidal action, demonstrated by the above experiments, might, at least in part, have been due to the action of the mercury, employed in the calibration, upon the lumen of the capillary tubes, they were repeated with tubes which had been graduated with water, in place of the mercury. As shown by the following table, the results were practically the same, although a few germs in this case resisted destruction for some time :—

| | *Virulent Strain.* Colonies. | *Non-virulent Strain.* Colonies. |
|---|---|---|
| After ¼ hour at 37° C. | 17 | 1 |
| " ½ " " | 15 | 1 |
| " 1 " " | 0 | 1 |
| " 2 hours " | 0 | 0 |
| Control tube | 250 | 200 |

In Klien's method a broth culture of *B. typhosus* is diluted with normal saline solution, and then mixed with varying amounts of immune serum and an excess of complement. The mixtures are then incubated for three hours and planted out on agar. A reduction in the number of colonies is taken as the end-point. Normal saline solution alone being able to kill 250 virulent typhoid bacteria after two hours' incubation, as is shown by the above experiments, it would appear, then, to be difficult to distinguish between the lethal effect of the salt solution and that of the immune serum. Klien, however, did not work with capillary tubes as we did, but with small test tubes, and on repeating his experiments with his own technique the bactericidal action of the normal salt solution was not apparent. However, it was not possible to adapt this method to our work, because the very large amount of blood serum which it requires, renders it unsuitable to the capillary tube methods necessitated where only a small amount of blood is obtainable from the patient's finger. It appears, however, to be a good method of estimating the bactericidal power of a given serum, and one more in accord with the dilution methods by which we estimate the titre of the agglutinins.

(3) In the following experiments it was desired to ascertain, as far as this could be done by laboratory experiment, what influence the *age* of a vaccine had upon its immunising properties. For this purpose a vaccine, prepared a year previously to the experiment, which had been out to New Zealand and had been subsequently returned to the laboratory, was used for the purpose of immunising a group of rabbits whose blood was subsequently "pooled" and submitted to quantitative tests of the protective substances. As controls, two other groups of rabbits were employed; one of these was inoculated with a freshly prepared vaccine, made from the same strain and by the same technique as the year-old vaccine, while the second was not inoculated, but furnished pooled serum for purposes of daily comparison with the blood of the two inoculated groups.

The details of the experiment may be followed by referring to the accompanying charts. (Charts I.-IV.) The rabbits received three doses of vaccine, 20, 40, and 80 millions respectively, at intervals of nine to eleven days, and tests were carried out as to the development of agglutinins and bactericidal substances, while the phagocytic ratio was, in each case, tested both by Wright's modification of the method devised by one of us (W. B. L.) and also by Klien's method of progressive dilutions of the serum.[1]

As regards the *bactericidal substances*, the method of serum dilution and plating, employed in our former work, was followed. As will be gathered by a glance at Chart I., there was no very marked evidence of superior development of these substances in the case of the rabbits immunised with either vaccine. An obser-

[1] *Johns Hopkins Bulletin*, vol. xviii., p. 245, 1907.

vation of the bactericidal power of the pooled serum of the uninoculated rabbits was made in every case, and the figure obtained daily was used as the normal standard. The system of recording the results on the chart is explained below in connection with the bactericidal observations on the blood of typhoid convalescents (p. 348).

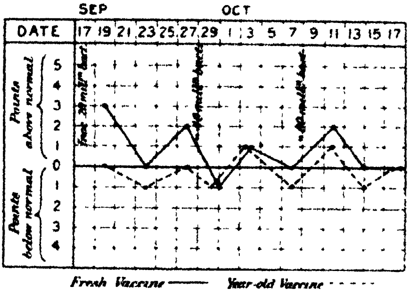

CHART I.—Development of *bactericidal substances* in groups of rabbits inoculated (*a*) with a *fresh* vaccine, (*b*) with one *a year old.*

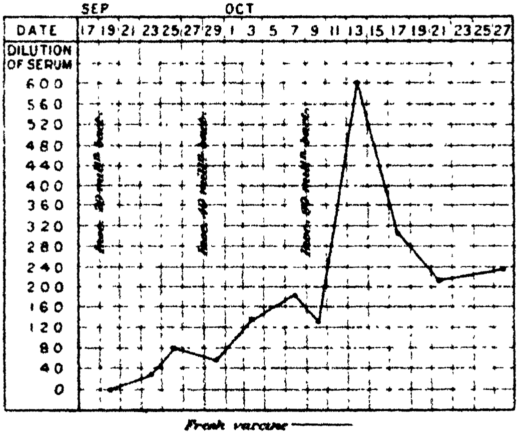

CHART II.—Development of *agglutinins* in groups of rabbits inoculated (*a*) with a *fresh vaccine*, (*b*) with one *a year old.*

NOTE.—*No agglutination* over 1-10 was noted in the rabbits inoculated with the old vaccine.

*Agglutinins.*—(Chart II.) A marked contrast was brought out by the analysis of these substances. While the rabbits inoculated with the fresh vaccine showed normal development of the agglutination curve, which, subsequent to the third dose, rose as high as 1-600, the blood of the rabbits inoculated with the year-old vaccine never showed any trace of these substances, the highest value recorded being a trace of agglutination in 1-10. The normal group were persistently negative.

*Phagocytosis.* (*a*) Wright's method. (Chart III.) The same technique, as detailed in the former reports, was used, and a very striking contrast will be noted in the degree of response to the individual inoculations. The rabbits which received the fresh vaccine showed a very marked rise after the second and third doses, and, at the end of the experiment, the phagocytic ratio was above 3; *i.e.*, phagocytosis was three times greater with the heated serum of the immunised rabbits than with the heated serum of the normal rabbits, used as controls at each observation. On the other hand, the indices of the group inoculated with the year-old vaccine showed far smaller fluctuations after each dose, although it is to

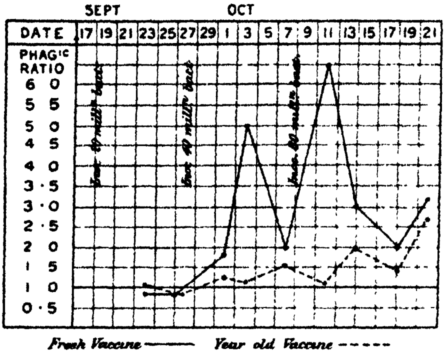

CHART III.—Curves of the *phagocytic ratio*, by Wright's method, in groups of rabbits inoculated (*a*) with a *fresh vaccine*, (*b*) with one *a year old.*

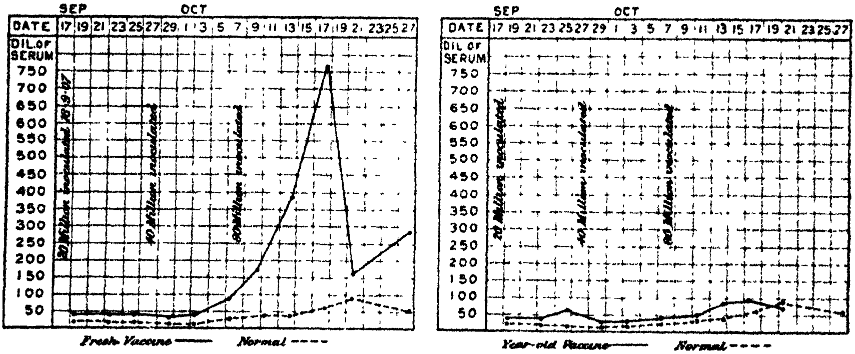

CHART IV.—Curves of the *phagocytic ratio*, by Klien's method, in groups of rabbits inoculated (*a*) with a *fresh vaccine*, (*b*) with one *a year old.*

be noted that the last observation was the highest recorded and approximately the same as with the fresh vaccine, namely 2·6. It may be added that it does not by any means follow that a rapid appearance of the substances influencing phagocytosis, as a result of inoculation, is to be taken as evidence that these substances will remain for long at this high level. It is indeed possible, as indicated by some of our incidental experiments, that a more lasting impression is to be obtained by a process which would, in its initiation, appear to be slow and inadequate.

(*b*) Klien's method. (Chart IV.) By applying this method, coincidently with the older one, a useful contrast of the methods was obtained, and the value of the results reached with the one could be controlled by those of the other. This method has been the subject of much experiment, and, although it occupies considerably longer in the carrying out, the observer to whom fell this portion of the work preferred it as giving more striking and more easily interpreted results. It will be seen that, in this instance, a regular and steep curve is the result of the inoculations with the fresh vaccine, followed by a sharp fall, though not to normal, on the inoculations being discontinued ; while, in the case of the rabbits inoculated with the old vaccine, Klien's method showed no elevation above the degree of phagocytosis exhibited by the non-inoculated control group.

From the general results of this experiment we gathered that the vaccine which was a year old and had voyaged round the world *had* lost a considerable portion of its immunising properties. As this was a point of the very first importance, the experiment was accordingly repeated, and the results of this second test are detailed below.

(4) In this experiment the immunising effect of three different vaccines was tested on three groups of rabbits, and the results were controlled by similar tests carried out on the "pooled" serum of a fourth group of normal rabbits. The three vaccines used had all been prepared from the same strain of *B. typhosus* and in the same manner, and differed only in respect of their ages ; these were, respectively, on the day on which the experiment commenced, six days, eleven weeks and five days, and twenty-seven weeks. On this occasion all the vaccines had been kept under identical conditions as regards temperature, &c., and none of them had been out of the laboratory. The question of possible changes in the vaccines due to temperature did not, therefore, come into consideration. (The effects of temperature alone formed the subject of a further series of experiments, detailed below.)

Each of the three groups of inoculated rabbits received, as in the former experiment, three consecutive and increasing doses of vaccine hypodermically, 20, 40, and 80 millions, at intervals of ten days, and their pooled serums were tested for agglutinins and for phagocytic substances, the latter by both the methods employed in the former investigation. Bactericidal substances were not measured on this occasion, as little useful information had been obtained from these tests in the earlier experiment, and as the time required was more than could be spared, since four separate quantitative estimations had to be made of each group and for each substance.

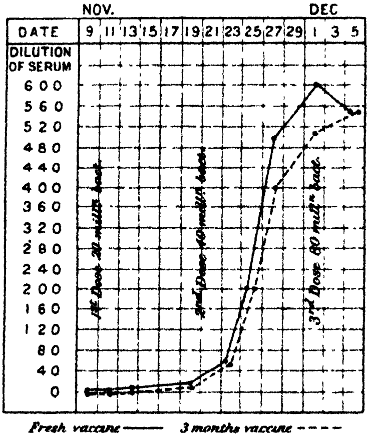

CHART V.—Development of *agglutinins* in three groups of rabbits, inoculated, respectively, with *fresh vaccine*, *three months' vaccine*, and *six months' vaccine*.

NOTE.—*No agglutinins* noted in the rabbits inoculated with the vaccine *six months' old*.

The results are shown in the accompanying Charts (V., VI., and VII.). The agglutinin curves (Chart V.) show a striking result; while there is little difference to be seen in the curves furnished by the groups inoculated with the fresh and with the three-months-old vaccines, in both of which there was a rapid and considerable development of these substances, there was, on the other hand, no trace of agglutinins to be found throughout the experiment in the case of the group of rabbits which had been inoculated with the six-months'-old vaccine.

The above result was borne out in a striking manner by the tests made in connection with the phagocytic activity of the immunised animals (Charts VI. and VII.). Here, again, there did not appear to be any essential difference between the fresh and the three-months' vaccines, while, in the case of the six-months'-old vaccine, the inoculated animals showed no difference from the normal rabbits. The index furnished daily by the pooled serum of this normal group represents, in all cases, the base or normal line upon which the curves have been plotted.

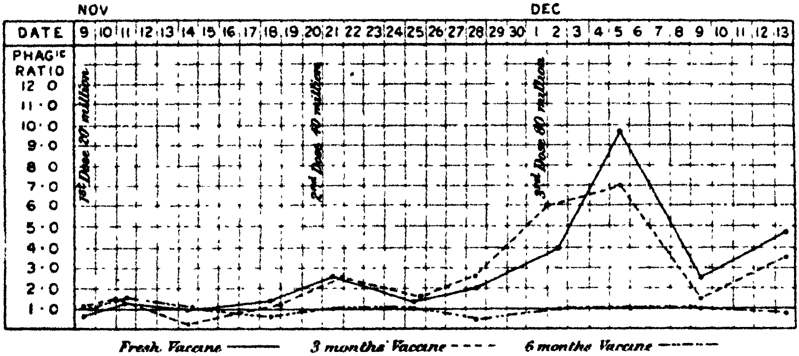

Chart VI.—Curves of the *phagocytic ratios*, by Wright's method, in three groups of rabbits, inoculated, respectively, with *fresh vaccine*, *three months' vaccine*, and *six months' vaccine*.

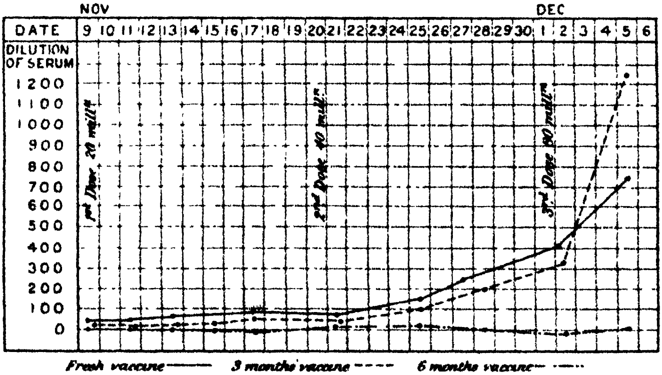

Chart VII.—Curves of the *phagocytic ratios*, by Klien's method, in three groups of rabbits, inoculated, respectively, with *fresh vaccine*, *three months' vaccine*, and *six months' vaccine*.

This experiment further serves as an illustration of the results of these two very different methods of estimating the opsonic content of the serum, or, as we prefer to call it, the phagocytic ratio. By the older method (Chart VI.) will be seen the customary fluctuations of the ratio which, as immunisation progresses, reaches a higher and higher level. The small fluctuations which occur in the record of the six-months' vaccine are within the limits of experimental error, and it is apparent that this vaccine had lost its power of inducing increased phagocytic activity when employed for immunisation.

Klien's method (Chart VII.) brings out the same essential points with equal clearness, though in a different form. Here the curves show much greater regularity, and indicate a slow developing but, in the end, a very marked increase in the substances influencing phagocytosis, as evidenced by the high degrees to which it was necessary to dilute the serum before Klien's "end-point" was attained. The two methods are alike in demonstrating that this six-months-old vaccine had, in this respect, acted as an inert fluid.

The general result, therefore, of these two series of experiments has been to show that a vaccine of six months age may have lost, if not all, at least a very large part of its immunising properties; so much so, indeed, that it would appear to be useless for the purpose for which it was intended. As soon, therefore, as we had convinced ourselves of this possibility, we took steps to ensure that no vaccine of greater age than three months should be used for inoculation, and instructions to this effect have been printed on the labels of each phial of vaccine, and issued to all concerned in its distribution.

(5) Attempted immunisation by ingestion of dead typhoid bacilli.

Our initial experiments in this direction, recorded in earlier reports, had shown some indications suggesting the possibility of inducing an effective degree of protection by this means. As such a procedure would offer manifest advantages over hypodermic inoculation, especially in the case of the soldier, a further series of experiments was instituted. On this occasion four volunteers underwent the treatment, which consisted in the swallowing of sterilised emulsions of agar cultures of *B. typhosus;* these were suspended in fat and enclosed in gelatine capsules to permit of their passing undamaged through the stomach. The bacteria had been killed either by being heated in the fat to a temperature of 60° C., or by being exposed to the vapour of chloroform before they were suspended in the fat. Each capsule contained the growth from half an agar slope, in a tube of the ordinary size.

The tests which were carried out were the estimation of the phagocytic activity of the blood, by Wright's and Klien's methods, and the agglutinin value of the serum. The attached Charts (VIII., IX., and X.) will show the number of and the intervals between the doses taken by each of the four volunteers, and the curves of these substances. The controls were made on each occasion from the blood of a normal and healthy individual. The experiment may be shortly summarised as follows, each case being dealt with separately:—

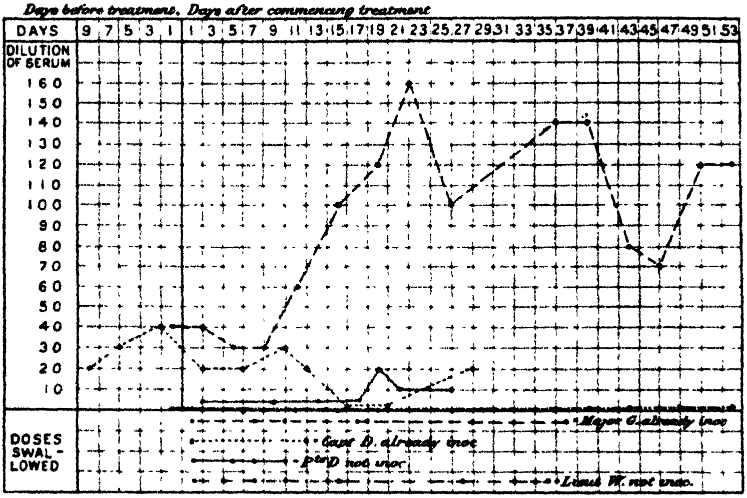

CHART VIII.—*Ingestion of dead typhoid bacteria.* Curves of *agglutinins.*

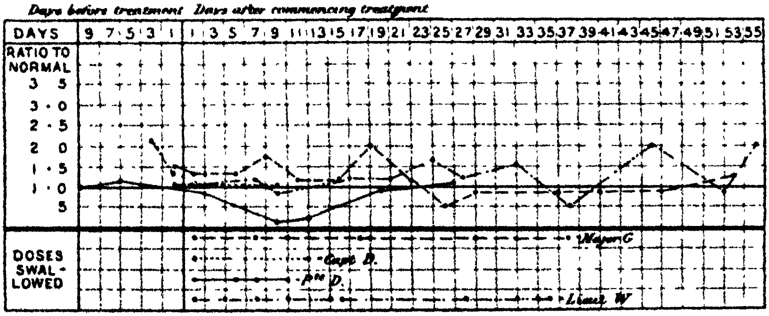

CHART IX.—*Ingestion of dead typhoid bacteria. Phagocytic indices* of four volunteers, tested by *Wright's method.*

*Case* 1.—Major G. Previously inoculated by the usual method. He took, in all, eight doses within five weeks. The treatment was followed by a marked and persistent elevation of the phagocytic ratio, as tested by Klien's method (Chart X.), but Wright's method did not on this occasion correspond with Klien's, as it showed a drop below normal after the fifth dose had been taken, and a persistently low value until a fortnight after the last dose (Chart IX.). Agglutinins, which, at the beginning of the experiment, stood at 40, rose to 160, and, at the time the observations were discontinued, still remained as high as 120.

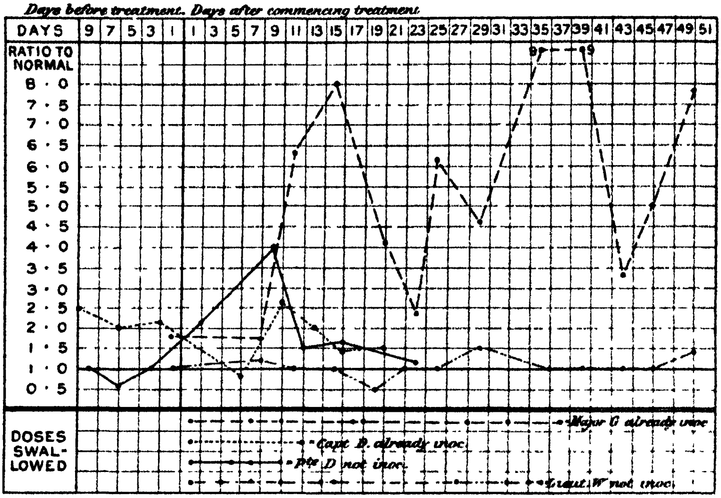

Chart X.—*Ingestion of dead typhoid bacteria. Phagocytic indices* of four volunteers, tested by *Klien's method.* (Chart reduced to unity.)

*Case* 2.—Captain D. Previously inoculated by the usual method. Only two capsules were taken in this case, as the subject was much upset by the treatment, considerable digestive disturbance resulting. His phagocytic ratio, which at the beginning of the experiment was well above the normal, fell, after some oscillations, to within normal limits. Agglutinins, which stood at 40 before the treatment was started, fell to vanishing point while it was in progress, but subsequently recovered on the capsules being discontinued.

*Case* 3.—Lieutenant W. Had neither been inoculated nor had enteric fever. He took ten capsules over a period of one month. They caused no unpleasant symptoms, but his blood throughout the whole experiment showed no signs of the development of either agglutinins or opsonins. (It may be noted in connection with this officer that, on being inoculated some months later with the usual vaccine, he showed an unusually severe type of local reaction; and his general reaction, although not very severe, was prolonged into the second day. It is possible that the effect of the large number of capsules had been in some measure to induce a degree of hyper-sensibility to subsequent inoculation.)

*Case* 4.—Private D. Had neither been inoculated nor had enteric fever. Four capsules were taken in ten days. A transient rise of phagocytic activity was evidenced by Klien's method during the period of treatment, but this disappeared rapidly on its termination. Wright's method, on the other hand, demonstrated a fall in phagocytosis when Klien's showed a rise. This contrast between the two methods is also in evidence in the other experiments, and is difficult to understand. A trace of agglutination appeared in his serum eight days after the last dose had been taken.

Taking these experiments as a whole, and bearing in mind our earlier work in this direction, it cannot be said that they furnish much hope of our being able to provide an efficient substitute for inoculation in the shape of pills or capsules of dead bacteria. It certainly appears to be possible to modify the contents of the blood, in substances bacteriotropic to the typhoid bacillus, by the ingestion of dead germs, but the results which we have obtained have been too irregular and too little under control to warrant a departure from the present system of inoculation. Immunisation by way of the digestive tract is, however, a subject which is occupying the attention of bacteriologists to a great extent at the present moment, and it is possible that some of this work may furnish us with indications as to a means of getting more efficient and reliable results than has been possible so far.

(6) The influence of the *virulence* of the strain upon the immunising properties of a vaccine.

In the preceding report[1] experiments, conducted on the same lines, appeared to show that a vaccine prepared from a virulent strain of *B. typhosus* would induce the development of a higher phagocytic ratio than one which had been prepared from a non-virulent strain. The point being one of considerable importance, in view of the fact that the vaccine used for the inoculation of troops has always been prepared from a non-virulent strain, a similar experiment was made to see whether the apparent advantage of the virulent vaccine would be manifest in rabbits inoculated in the same manner and tested by both phagocytic methods.

Two vaccines were accordingly prepared, one from the non-virulent strain in common use, the other from a virulent and recently isolated strain which was lethal to a guinea-pig of 250 grammes weight when 0·5 c.cm. of a twenty-four hours' broth cul-

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[1] JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. x., p. 583, 1908.

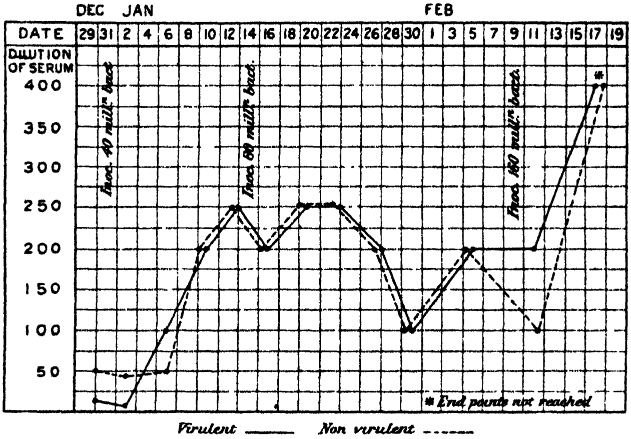

CHART XI.—Development of *agglutinins* in groups of rabbits which had been inoculated with vaccine prepared from *virulent* and *non-virulent* strains of *B. typhosus*, respectively.

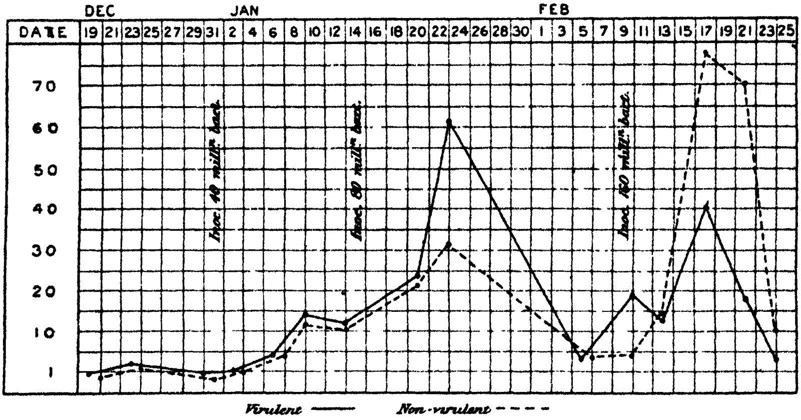

CHART XII.—Curves of the *phagocytic ratios* by Klien's method (reduced to unity), in groups of rabbits which had been inoculated with vaccine prepared from *virulent* and *non-virulent* strains of *B. typhosus*, respectively.

ture was inoculated intra-peritoneally. Three groups of rabbits were employed, the third serving, as usual, as a daily control of the quantitative estimations of the protective substances. As will be seen from the Charts (XI., XII., and XIII.), several observations were made on each group prior to the first inoculations. The results of these preliminary estimations serve as a check to the values recorded after the immunising process had commenced, and, incidentally, bear witness to the accuracy of the methods themselves. The two groups of inoculated rabbits received in all three doses, the second fourteen days after the first, and the third twenty-six days after the second. The dosage was, respectively, 40, 80, and 160 million bacteria.

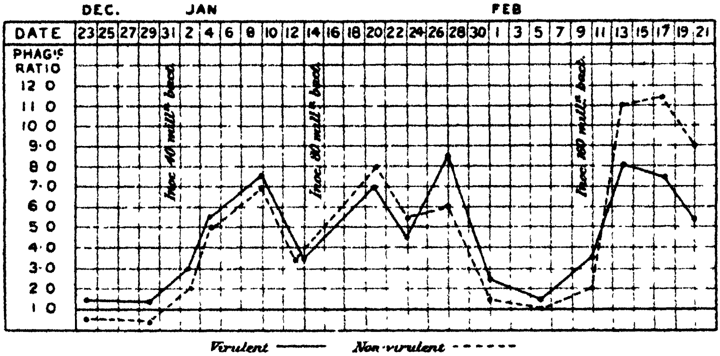

CHART XIII.—Curves of the *phagocytic ratios* by Wright's method in groups of rabbits inoculated with vaccine prepared from *virulent* and *non-virulent* strains of *B. typhosus*, respectively.

The development of the agglutinins may be followed in Chart XI., and a glance will show that there is nothing to choose between the two vaccines in respect of these substances, the close correspondence of the two curves being, indeed, a remarkable feature, and, in our experience, a rare one. The test strain of *B. typhosus* employed for measuring the agglutination was a non-virulent one, but, of course, different from the non-virulent strain employed for inoculation; it was selected for the purpose as one which furnished a good emulsion, and was of proved value for such tests.

The phagocytic ratio, tested both by Wright's and by Klien's methods (Charts XIII. and XII.), responded readily to the inoculation of each vaccine, and here again it is not possible to assign a greater value to one vaccine than to the other; both curves will be seen to follow similar lines, and, in spite of the wide range of the records, the values recorded on any one day for the two groups of rabbits are never very far apart. If one appeared to show to advantage at one time, the balance inclined to the other side at a later observation. Thus, as was the case with the agglutinins, no difference was elicited with regard to the development of the substances influencing phagocytosis. The test strain employed in these experiments on phagocytosis was a virulent one, and had been recently isolated from a case of enteric fever occurring in Bermuda.

From the above experiment, which covered a period of more than two months, we were unable to confirm the impression which the former series had given us, and it would appear that the inoculation of a vaccine prepared from a non-virulent strain of typhoid bacteria is capable of inducing as satisfactory development of agglutinins and substances influencing phagocytosis as one made from a virulent strain.

(7) The influence of the temperature at which a vaccine has been kept upon its immunising properties.

It was possible that the deterioration which some of the vaccines had been found to have undergone, after a certain lapse of time, might have been due, not to the factor of age alone, but to the conditions under which they had been stored. Of these conditions the most variable must be the temperature at which the vaccine has been kept. A vaccine sent out to the Tropics might change in some manner to which it would not be liable in a temperate climate. The influence of light can hardly be held as a possible cause of deterioration, as it may be assumed that the vaccine is left in the boxes in which it is packed until the moment of use, and the manner in which it is hermetically sealed in the glass phials should render other factors negligible.

The temperature, then, remained to be tested, and the following experiment was undertaken. After the preparation of a certain brew of vaccine, three samples of this brew were set aside for three months; one portion was kept at the ordinary temperature of the laboratory, the second in the ice-chest, and the third in the hot incubator at 37° C. All were kept in the dark, and they were not disturbed in any way until the three months had elapsed.

At the commencement of the fourth month from the date of the preparation of the vaccine, a series of immunising experiments was commenced on groups of rabbits. Four of these groups, comprising three animals in each, were employed; one served as the control group, while each of the three remaining groups was inoculated with one of the three samples of the vaccine, the doses being identical in each case.

Estimations were made on the agglutinins and of the phagocytic power of the blood, the latter by both Wright's and Klien's methods. No attempt was made to measure the bactericidal substances, partly on account of the great labour involved in carrying out so many observations on four groups of animals, and partly because this method demonstrates great individual variations in the case of rabbits. The rabbits received, in all, four doses of vaccine, consisting of 20, 40, 80, and 160 millions respectively, the intervals being recorded on the accompanying charts (XIV., XV. and XVI.).

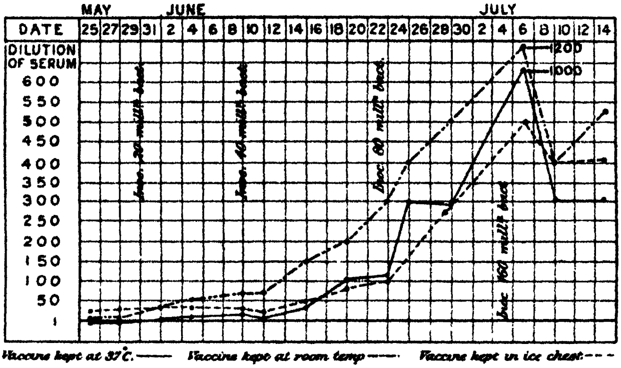

**Chart** XIV.—*Agglutination curves* of three groups of rabbits inoculated respectively with vaccine kept at *room-temperature*, at 37° C., and in the *ice chest.*

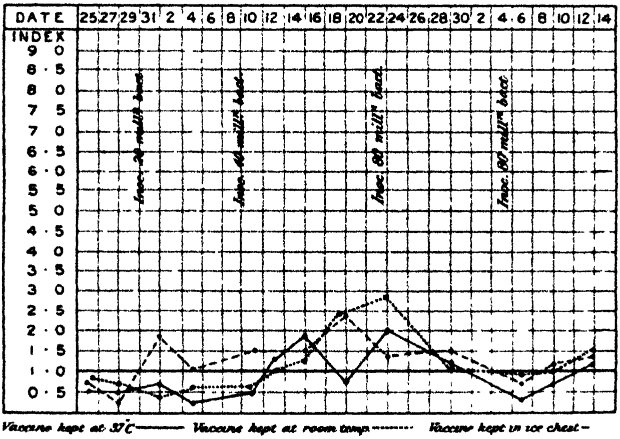

**Chart** XV.—Curves of the *phagocytic indices*, by Wright's method, in three groups of rabbits inoculated, respectively, with vaccines kept at *room-temperature*, at 37° C., and in the *ice chest.*

It is unnecessary to comment at length on the results of the experiment, as the details can be followed in the charts, and it will suffice to summarise the conclusions which appear to emerge from them. (1) The vaccine which had been kept at room temperature comes out of the test best. (2) The samples which had been kept in the hot incubator and in the ice-chest gave, approximately, the same results; neither was inactive, but both appeared to have lost a portion of their immunising properties, as contrasted with that which had been kept at room temperature, and, also, with the results of former immunising experiments on rabbits, carried out with vaccines of about the same age which had been kept under similar conditions.

It would appear, therefore, from this experiment, that it is advisable to keep typhoid vaccine at a moderate and, as far as may be, equable temperature, and that extremes, either of heat or cold, are deleterious and to be avoided. It seems clear, further, that nothing is to be gained by keeping vaccines in the ice-box, a suggestion which has been made on several occasions with a view to the possible preservation of their properties.

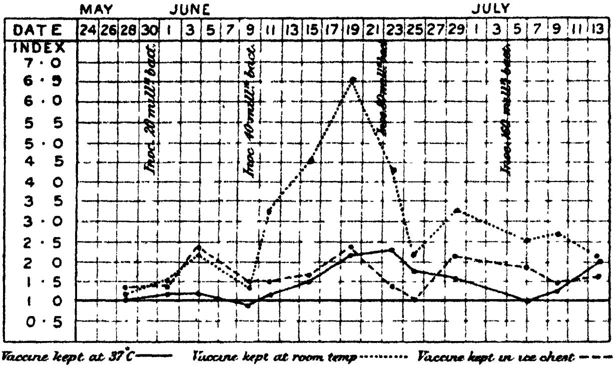

CHART XVI.—Curves of the *phagocytic indices*, by Klien's method, in three groups of rabbits inoculated, respectively, with vaccines kept at *room-temperature*, at 37° C., and in the *ice chest.*

(8) Investigation of the blood-changes following an attack of enteric fever.[1]

Our aim here was to determine the average course of development of the various protective substances after an attack of enteric fever, in the hope that the results, when contrasted with those which we know to follow inoculation of typhoid vaccine, might give us useful information as to the particular substance or substances which we should endeavour to call forth by our inoculations. This was thought to be worth attempting in view of the uncertainty which still prevails as to the relative importance attaching to the various substances which are demonstrable in the blood in acquired immunity, whether this be natural immunity, as after an attack of the disease, or artificial, as after a bacterial inoculation.

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[1] In this experiment we were assisted by Lieut. R. G. Archibald, R.A.M.C., whose careful and accurate work was of the greatest help to us.

With this end in view, the following substances were estimated in a series of cases: agglutinins, bactericidal substances, stimulins and opsonins. The system adopted was to collect the serum of each typhoid patient or convalescent and to test this once, and once only, for the above substances, recording the results on a single chart under the particular week after infection in which the observation was made. The investigation was carried out as opportunity offered, and forty-one cases were collected within six months and dealt with in this way. The majority were convalescents furnished by the military hospitals of Netley and Millbank. Arrangements were made to secure uniformity in the work by allowing the serum, in all cases, to remain in contact with the clot for twenty-four hours, before it was drawn off and submitted to analysis. The charts record the individual observations made on these forty-one cases, each being entered under the particular week after infection, and the curves for each substance were subsequently constructed by taking the average of the observations recorded for each particular week. As was anticipated, considerable individual variations were encountered and, on this account, it was decided to mark a point in this curve only when it could represent the average of at least two observations made during the same week. In the later months of convalescence, however, when such individual fluctuations should be less in evidence, the average of two or more observations, made during the same fortnight, was recorded, if there was no more than one observation in a given week. In the above manner it was hoped that the average blood-picture following an attack of enteric might be forthcoming, and that this might guide us in assessing the results of our experiments with typhoid vaccine.

Information was elicited in all cases as to whether the original attack had been mild, ordinary, or severe, but those tested comprised too small a proportion of mild cases to yield us much information in this connection, and the curves in general may be taken to represent the course of events following on a severe attack. The preponderance of the severe cases is due to the fact that most of the men were soldiers who had been invalided from their foreign stations on account of the severity of their attack; mild cases are not now invalided from abroad, and the few whom we had the opportunity of testing were cases contracted in this country and admitted either to Netley or to Millbank, or those invalided for some other cause.

In the accompanying charts (XVII., XVIII., XIX. and XX.) the actual observations made on the serum of each convalescent are

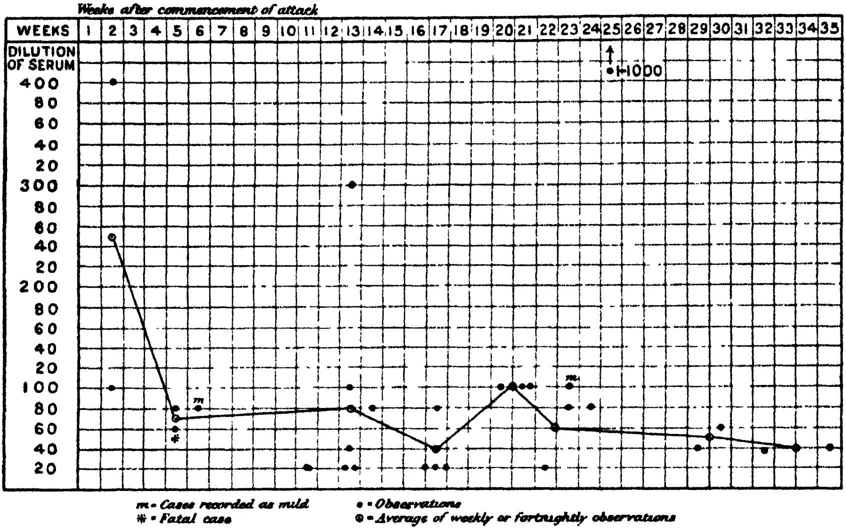

CHART XVII.—Average curve of *agglutinins* after enteric fever.

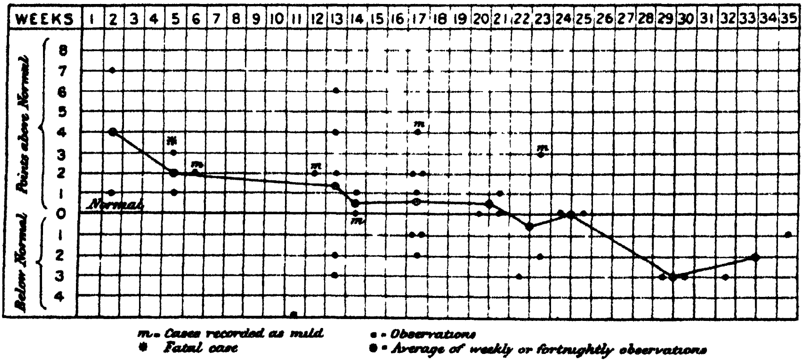

CHART XVIII.—Average curve of *bactericidal substances* after enteric fever.

recorded as dots under the week in which they were tested, while the curves constructed from the averages, in the manner just mentioned, are, for the sake of clearness, recorded on the same charts, the points representing the averages obtained for each week being shown as hollow dots. Where this average has been taken from the mean of the observations in a fortnight instead of a week, it is placed on the line between the two weeks.

The number of cases investigated during the actual course of the attack was very small, and the observations during the weeks immediately following defervescence are also few in numbers, but, allowing for this, the general results bring out several points which appear to us to be of considerable interest.

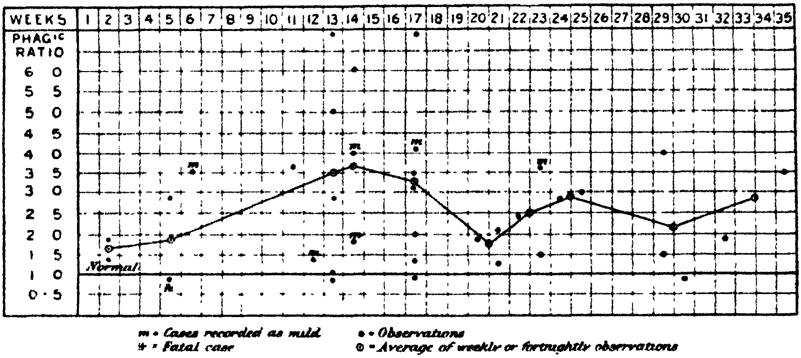

CHART XIX.—Weeks after commencement of attack. Average curve of the *phagocytic index* after enteric fever.

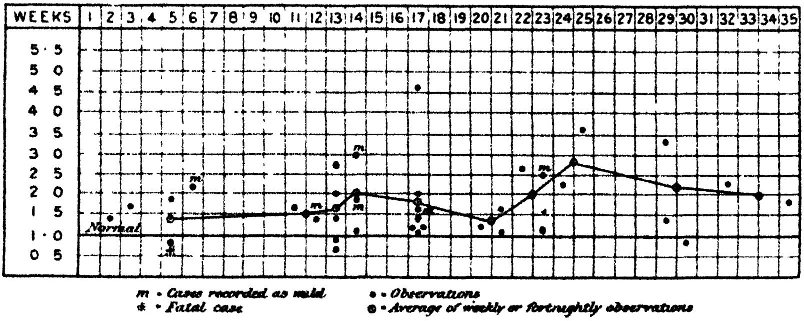

CHART XX.—Average curve of the *stimulins* after enteric fever. Weeks after commencement of attack.

To take the agglutination curve in the first instance. No new features are to be noted; the course of the agglutinins, during and after an attack of enteric, has formed the subject of many investigations, and the results brought out here are quite in accordance with the usual experience. Observations were made on twenty-eight cases, and the general course of these substances may be followed in Chart XVII.; the rapid fall in the agglutination value of the serum after the decline of the fever is brought out, and the low level at which it remains during the following months is also evident. At the same time, although the level is low, in no case was a negative result obtained, even eight months after the date of the attack. In one case, tested in the twenty-fifth week, the exceptionally high agglutination figure of 1-1,000 was obtained; this, although recorded in the chart, has not been taken into account in framing the average, as it is rare to find such a figure, even during the height of the disease; at the same time the observation is an interesting one, and suggests the possibility that the individual from whom it was obtained was a "typhoid-carrier," although we had no opportunity of putting this to the proof. Only two cases were classed as having been "mild," the remainder being either of ordinary severity or "severe." The only case which terminated fatally, subsequent to the date of our examination, showed, in the fifth week of the attack, a low figure of agglutination, 1-60.

*Bactericidal Power.*—In all, thirty-three cases, ranging from the second to the thirty-fifth week, were tested as to their bactericidal power; five of them were classed as "mild" (noted with an "m" on the chart), and the remainder were almost all recorded as "severe." The technique was that we have employed in the similar estimations recorded in former reports, namely, progressive dilutions of the serum were allowed to remain for a definite time, at blood heat, in contact with a measured test-dose of living typhoid bacteria, the mixture being subsequently plated out on agar. The chart (No. XVIII.), however, is framed on somewhat different lines, in order to show the results more graphically. Each observation of a convalescent's blood was controlled by a similar observation on the blood of a healthy man, and the system of recording the results of these tests was to enter the figure obtained from the typhoid patient as being so many points better or worse than the figure yielded by the normal individual; for instance, a serum which killed the test-dose of typhoid bacteria in a dilution of 1-60, while the control could only kill a similar dose in a dilution of 1-40, would be charted as being two points above the normal line.

The curve, plotted from the averages in the manner just described, shows the rapid decline of these bactericidal substances after defervescence and the gradual fall to normal, or even below normal, six months after the attack. Allowing for the inequality of the two groups, it may be seen that the average value of the cases recorded as having been "mild" is considerably higher than that of the severe cases which constitute the majority. The fatal case, when tested, showed a comparatively good bactericidal power, a point which will be referred to again in considering the phagocytic results.

*Phagocytic Ratio.*—This was tested with the heated serum of the individual by Wright's method, and compared, on each occasion, with the phagocytic powers of the heated serum of a normal man. The individual observations are recorded and the curve is plotted from averages, as described above (Chart XIX.). The thirty-five observations made between the second and thirty-fifth weeks, although showing the great range of individual variations, bring out a marked contrast to the curve of the averages of the bactericidal observations. Beginning at a low point, little above the normal, the phagocytic power rises, sometimes to a great height, in the weeks following convalescence, and this elevation is well maintained up to the eighth month after the attack; it will be recalled that the bactericidal power appeared to decline steadily during the same period until it was the same as normal, or even below normal. On the whole, the power of the six cases classed as mild appeared to be a little higher than that of the severe cases. A further point of interest is in connection with the observation made in the fifth week on the serum of the case which terminated fatally; it will be seen that the figure here was only ·8, and that this is the only instance in which a figure less than normal was recorded within the first twelve weeks.

*Stimulins.*—Observations were made on the serum of thirty-five cases to ascertain whether the stimulin effect of adding a trace of their heated serum to the heated serum of a normal individual could be demonstrated with any regularity (Chart XX.). For the technique of the method for eliciting this phenomenon the reader is referred to former reports. Although not very marked in the early days of convalescence, the serum of the later cases shows a considerable power of stimulating the phagocytic activity of the leucocytes of a normal man. The curve of stimulin averages, like that of the phagocytic index, shows a tendency to rise as the months go on, and no tendency to drop, even at the end of eight months. Once more, too, the only negative result within the first twelve weeks was in the case of the man who died.

Too much stress is not laid upon the results of this investigation, the numbers are obviously too small and the individual variations too great, but, at the same time, certain general information, of the kind which we sought, does appear to us to be brought out by a careful consideration of the curves plotted from the averages. The steady declines both in the agglutination curve, and, more especially, in the curve of the bactericidal power, stand out in striking contrast to the curves of the substances connected with phagocytosis. The impression which this leaves on our minds is that the latter are produced in increasing amount after convalescence, and that they remain demonstrable in the blood-serum for longer periods than, at least, the bactericidal substances. It is, then, a matter of conjecture whether these phagocytic substances are not those which have most to do with the acquired immunity conferred on an individual by an attack of enteric fever. Some support for this view may be found in the results of our immunisation experiments on man and animals by the inoculation of typhoid vaccine, for here, too, phagocytosis is markedly increased, and the increased power is demonstrable for long periods after inoculation.

Owing to the small number of the cases classed as mild, little can be gathered as to the development of the various substances in relation to the severity of the attack. On the whole, it would appear that in the prolonged and severe cases there is a diminished production of protective substances, and that this comparative poverty is not compensated during convalescence. Finally, although the fatal case was an isolated one, the blood examination in this brought out an interesting condition, namely, that although the agglutinins were of moderate amount and the bactericidal power good, the tests as to phagocytic activity demonstrated that this was in default and even below that possessed by a normal individual. This, if found to be a general rule in similar cases, would furnish a point of prognostic value, and would also testify to the importance of phagocytosis in combating an attack of enteric fever.

# THE COMPLEX NATURE OF TYPHOID ETIOLOGY, AND THE *RÔLE* PLAYED BY ANIMALS AND MAN IN THE SPREAD OF THE TYPHOID GROUP OF DISEASES.[1]

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*Royal Army Medical Corps.*

The question of the etiology of enteric or typhoid fever covers so wide a field of thought and conjecture, work and knowledge, that it would be unprofitable, even impossible, for me to attempt to deal with its every phase. It may be thought, and I have more than once heard it suggested, that the subject has been over-discussed and is consequently ill-chosen; but the more I work at typhoid etiology the greater is my conviction that much work must be done, and many present-day theories be modified, ere the true nature of typhoid etiology stands revealed, and its truths are generally understood and accepted.

Before we can profitably discuss the question of typhoid or enteric etiology, it is necessary to clearly realise what these words mean both in their clinical and bacteriological senses. Typhoid means typhus-like, and was used to represent the clinical picture of prolonged fever—abdominal symptoms, exhaustion, and mental apathy—often present in this disease. The word "enteric" was introduced owing to the prevailing idea that intestinal lesions and symptoms were always present in typhoid. Now these terms "typhoid" and "enteric" have the sanction of long usage, and will stay in consequence, but unless we are careful this nomenclature is liable to lead us into diagnostic error, and has possibly even helped to keep alive and spread endemic and epidemic typhoid. The clinical symptoms which give rise to the term "typhoid" accompany only one of the phases of a disease in which at another time none of the clinical manifestations of the typhoid state may be present. The term "enteric" is applied to a disease in which intestinal lesions and symptoms may be conspicuous by their absence.

Pathological conditions of such varied nature as hepatitis, sore throat, general adenitis, bronchitis, pneumonia, cholecystitis, or localised purulent affections, such as abscesses, middle-ear diseases, &c., may be induced by micro-organisms similar to those which cause typical typhoid fever (Mya,[1] Bersenius,[2] Besançon,[3] Philibet[4]). The micro-organisms which produce these widely varying pathological conditions themselves vary considerably. Fifteen, even ten years ago, it might have been confidently stated that in the *Bacillus typhosus* of Eberth had been found the unique causal agent of the dangerous and widespread disease, typhoid fever. The knowledge of recent years has forced us to realise that there are quite a number of allied but distinct species of bacteria, any one of which is capable of originating typhoidal disease—that, in fact, the etiology of this condition is as complex as its symptomatology. Further, we now also know that this group of bacteria, while at one time originating a disease with all the clinical symptoms of typhoid fever, may, at another, cause pathological conditions utterly unlike it. Typhoid is, in fact, a group disease, produced by a group of organisms.

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[1] A paper read before the Public Health Section of the South African Medical Congress, October 14th, 1907.

It will be my endeavour in the first part of this paper to prove the complex etiological nature of this paradoxical disease, and in doing so I shall endeavour to limit references and technical details as much as possible, as I am aware how tedious a paper such as this must be in any case. In the appended table are given the bacteria which produce the typhoid group of diseases, along with their cultural reactions, pathogenic effects, and variety of animal hosts. The first column of the table gives the names of these various bacteria; the second, the pathogenic effects they produce on man. The third and fourth columns briefly specify the morphological and cultural characters and the specific agglutinative reaction of these bacteria. In the fifth column are enumerated their animal hosts. The first part of my paper refers to the complex nature of typhoid etiology, and while discussing this question I shall largely refer to the information in the first three columns of the table. The last column, dealing with various animal hosts of this group of bacteria, I shall refer to chiefly in the second part of this paper, which mentions the *rôle* played by animals and man in the spread of typhoid disease.

By looking at the table it will be seen that six species of bacteria, more accurately sub-groups of bacteria, are mentioned as capable of originating disease in man indistinguishable from typhoid fever, and to show that this paper represents no mere academic discussion, I may mention that bacteria of all the groups but one mentioned in this table have been isolated from typhoid cases admitted to the Military Hospital at Roberts' Heights, Pretoria, during the last few months. The bacteria were isolated from the blood of these cases by a new and simple method, originated by Conradi[1] and Kayser.[2] I shall presently discuss these various bacteria in turn, but think it advisable at this stage to explain what are the morphological and cultural characters of the bacteria of this large group and on what they depend for individual differentiation.

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[1] *Cent. f. Bakt.*, Ref., May 23rd, 1905.

[2] *Ibid.*

[3] *Journ. de Phy. et. Path. gén.*, t. vi., 1904.

[4] *Iibd.*

Morphologically, all the bacteria of this group are short motile rods. The paratyphoids are more motile than the typhoids, and these latter than the colon bacteria. All the bacteria of this group named in the table are readily stained by solutions of aniline dyes, and all of them have the peculiarity that, when stained by one of these dyes (aniline gentian-violet) and subsequently treated with a solution of iodine, they are rapidly decolorised by washing with alcohol. This staining peculiarity is known by the name of Gram's reaction.

A general characteristic is the power possessed by these bacteria of fermenting sugars, and the measure of their individual activity in fermenting these sugars is one of the best means we have at present of differentiating, culturally, between the individual members of this great group. For the sake of simplicity, I have limited the various reactions of these bacteria to their action on the two sugars, glucose (grape sugar), lactose (milk sugar), and a body closely allied to a sugar, mannite. The production of acidity and the formation of gas generally represent, the one in a lesser and the other a greater degree, the fermenting power of a bacterium of this group.

To allow of the growth of the bacterium, some nutrient medium, such as jelly (agar), broth, &c., is associated with the sugar, and to illustrate the production of acidity or alkalinity from a sugar medium various colouring reagents, like litmus, neutral red, and others, are added, which indicate any change of reaction by a change of colour. The production of gas is made evident, in a solid medium like agar, by the production of gas bubbles which are imprisoned in its substance. In a fluid medium, an inverted glass capsule collects and shows any gas that may be formed.

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[1] *Münch. med. Wochenschr.*, 1906.

[2] *Cent. f. Bakt.*, Orig. xlii., September 1st.

The three media are: (1) An agar medium containing grape sugar (glucose), and an indicator (neutral red); (2) milk, which of course contains milk sugar or lactose, and to which the indicator litmus has been added; (3) a nutrient solution containing mannite, to which litmus has also been added.

*Bacillus coli communis* is the most active sugar fermenter, for it first acidifies and then coagulates litmus milk, produces both fluorescence and gas abundantly in the neutral red glucose-agar (note the gas bubbles and yellow colour), and also markedly affects the mannite medium, producing great acidity and abundant gas in the inverted capsule in the tube. The paratyphoid bacillus named "B" approaches, though it does not equal, the colon bacillus in its sugar-fermenting power. It produces first acid and then alkali in milk sugar; the medium is first turned pink, and later (six days) blue; the milk is, however, not coagulated. In neutral red agar and in mannite broth there is acid and gas production, but to a less degree than with *B. coli.* The paratyphoid bacillus termed "A" is a less powerful fermenter of sugar again than the type "B." Milk sugar is slightly but permanently acidified, while the production of acid and gas is less pronounced in the neutral red agar (less yellow) and mannite media (very little gas produced). The typhoid bacillus produces such slight changes in milk sugar and grape sugar neutral red that these media remain practically unaltered, while the mannite medium is turned from blue to red, but contains no gas in its gas capsule. The *B. fæcalis alcaligenes* is unable to ferment sugars, consequently these media are not affected by its presence. The litmus milk alone will turn a deeper blue, owing to alkali formation.

No. 1 on the list of these bacterial groups in the table is the *B. fæcalis alcaligenes.* Not much is known regarding the animal distribution of the bacillus whose cultural reaction I have just given, but it has been isolated in some instances from the dejecta of man, both in health and disease, and has been supposed on more than one occasion to have originated a condition simulating typhoid fever. The next bacterium, and the most important of the group associated with typhoid disease, is No. 2 in the table, the *B. typhosus* of Eberth. While producing the classical clinical picture of typhoid fever more frequently than any other of the typhoid-colon group of bacteria, the typhoid bacillus cannot now be considered, as was the case a few years ago, the sole producer of the disease. Furthermore, it may induce diseases of a type utterly unlike typhoid. Mya, Bursenius, Besançon, Philibet and others have reported cases proved, bacteriologically, to be of typhoid nature, where the clinical symptoms were limited to sore throat, bronchitis, pneumonia, perityphlitis, nephritis, influenza, hepatitis or general adenitis; or, again, to local purulent affections, such as abscesses or middle-ear disease. Even when fever is present other symptoms, like rash, abdominal symptoms, &c., may be absent; further, the duration of the fever may be anything from two days to two months.

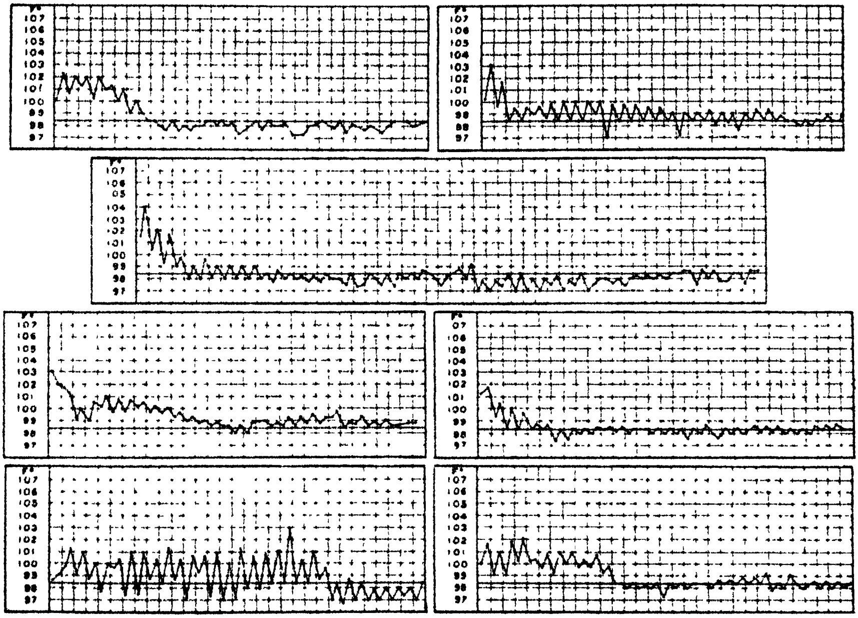

FIG. 1.—Photographs of seven temperature charts from cases of typhoid disease The first three and the last two charts are from patients who suffered from fever caused by the *B. typhosus.* These charts represent a type of typhoid frequently met with in Pretoria. The chart marked orange is from a case from whose blood the *B paratyphous*, type "B," was isolated (orange had been twice inoculated against typhoid). The remaining chart is taken from a woman who suffered from fever, jaundice and pain over the gall bladder, and whose blood serum gave a markedly positive Widal reaction. The case was, I think, one of typhoid cholecystitis.

The above are temperature charts of cases proved, bacteriologically, to be due to the typhoid bacillus (see fig. 1). These cases were in hospital (1907) during what we call the typhoid season. It will be perceived how greatly the type of disease varies. One of these temperature charts comes from a woman who suffered from pain over the liver, accompanied by jaundice. She gave a positive

Widal reaction to typhoid, and I believe the case was one of typhoid cholecystitis. The woman had never suffered from what we could clinically call typhoid fever.

*Post-mortem* examinations of cases of typhoid fever show that while the swelling and ulceration of Peyer's patches is usually a marked feature in adults, it may be absent. We had such a case this year. In children the patches of Peyer are frequently left unchanged. (Brion and Kayser.)[1]

While, as I have already stated, the *B. typhosus* is morphologically identical[2] with the six others of the typhoid-colon group, it is sharply differentiated from most of them by its cultural characters, particulars of which have already been given. There is another way in which the typhoid bacillus may be distinguished from the others of its group. I refer to its specific agglutination reactions. There are many bacteria which are agglutinated by the serum of the man or animal suffering from the disease they have produced. The specific property of such a serum may be retained even when it is diluted hundreds, even thousands of times, so delicate is the reaction. This reaction is named after Widal, who first recorded it. The serum of an animal or man suffering from disease produced by the *B. typhosus* may also agglutinate allied bacteria, such as the individuals of the typhoid-colon group; but this group agglutination reaction only takes place, as a rule, in a low dilution of the serum, and never in the high dilutions in which it will agglutinate its own causative organism (specific agglutination). I will not refer to other methods of differentiation, such as immunity reactions and inoculation experiments, which are too technical.

The third bacterium which may produce a disease indistinguishable from typhoid fever is the *B. paratyphosus* (A). This is by far the rarer of the two varieties of paratyphoid bacteria, of which much has been said and written during the last ten years. I do not know of more than a dozen or so of strains of this organism which have been isolated. I have had the rare good fortune to isolate bacteria of this group from the blood of four cases of typhoid fever at the Military Hospital, Pretoria. Fig. 2 represents the temperature charts of these cases, from which it is evident that, clinically, they could not be distinguished from the conditions produced by the *B. typhosus*.

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[1] *Deutsches Archiv f. klin. Med.*, lxxx., 1906.

[2] The question of differentiation of the members of the typhoid-colon group by the number and position of their flagellæ was not introduced.

To those who may not have closely followed the question of paratyphoid affections, I will briefly mention the facts concerning their discovery and subsequent history. Ever since Widal introduced his now well-known method of diagnosis by means of agglutination tests, it had been remarked that a small percentage of cases, clinically like typhoid, never gave the expected serum reaction. The mystery was cleared up when, in 1896, Achard and Bensaude[1] isolated two atypical typhoid bacilli, one from a post-typhoid abscess, and the other from a case of cystitis. These bacteria differed from the typhoid bacillus in certain cultural characters, to which I have already referred, as well as by the fact that the serum of patients affected did not agglutinate the typhoid bacillus except in low dilutions (group agglutination). Achard and Bensaude's discovery was quickly followed by those of Widal and

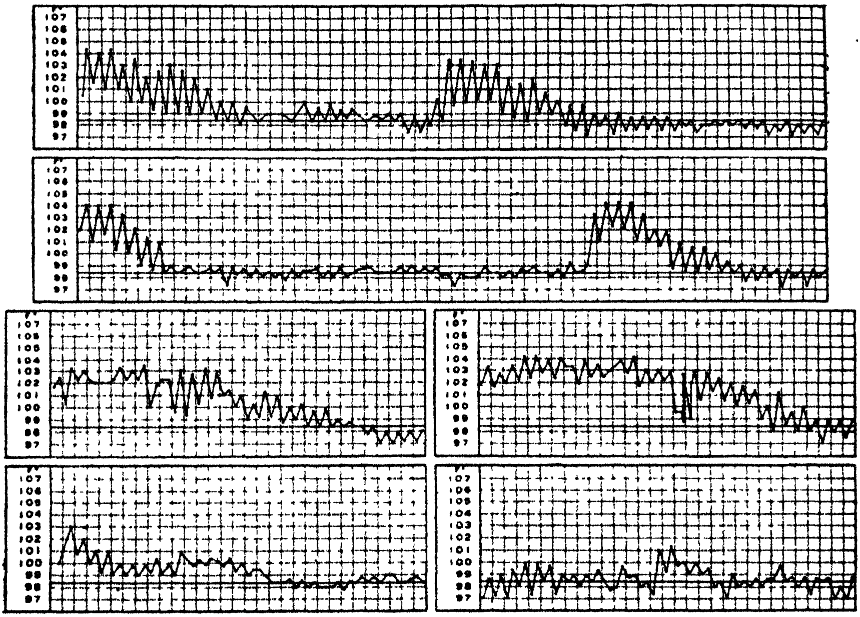

FIG. 2.—Photographs of six temperature charts from cases of paratyphoid fever. From the first four cases a bacillus of the type paratyphosus "A" was isolated, while from the patient whose temperature chart comes last on the plate a bacillus closely resembling the *B. coli communis* was recovered by hæmoculture.

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[1] *Soc. Méd. des Hôpt. de Paris*, 1896.

Noblecourt,[1] Gwyn,[2] Cushing,[3] and many others. Finally Schötmuller,[4] Brion and Kayser,[5] in 1902, classified the paratyphoids by dividing them into two groups, which they called "A" and "B." "A" is distinctly a rare organism, while the bacteria which resemble *B. paratyphosus* "B" are found in many domestic and other animals, and have caused numerous epidemics of disease among men.

After seeing the temperature charts of the four cases of paratyphoid "A" disease previously referred to, it will be seen how difficult is a clinical diagnosis between these cases and the similar condition produced by the allied micro-organism, the *B. typhosus.* In the few cases of paratyphoid affections which have been examined *post mortem*, it has been found that in some Peyer's patches are not ulcerated (Jochman,[6] Sion and Negel,)[7] but this condition of the intestine may also be found, as I have already stated, in disease caused by *B. typhosus.* The cultural reactions of the *B. paratyphosus* "A" have already been pointed out. Its fermenting power on sugars is greater than that of the *B. typhosus*, while not so marked as those of the paratyphoid group "B." The blood sera of patients suffering from the paratyphoid "A" affection, specifically agglutinate the *B. paratyphosus* "A," which fact further differentiates this organism from others of the typhoid-colon group.

I now come to a large and important group of very closely allied, probably identical, organisms, any one of which may produce typhoid disease in man. This group includes the *B. paratyphosus* "B," the two groups of meat-poisoning bacteria, and various bacteria known by the disease they cause in animals, viz., *hog-cholera group, B. morbificans bovis,* bacillus of calf septicæmia, *B. psittacosis,* and *B. typhi murium.* It is not necessary at present to discuss the striking connection between human typhoid and the disease of domestic animals, because I shall deal specially with this subject in the latter part of this paper.

It is probable that under the variously named bacteria in this group we often refer to one and the same organism. No clear morphological or cultural distinctions have yet been discovered which can serve to distinguish one from another (Trantman,[8] Kolle,[9] Wasserman).[10] All the bacteria in this great group produce gas and fluorescence in the neutral red glucose-agar medium, and form acid and gas in the mannite-litmus solution. Their action on litmus-milk is especially characteristic, the medium being first turned reddish and then, through subsequent alkalisation, into a deep blue colour (Kutscher and Meinicke)[1]. Further, except for the second group of meat-poisoning bacteria, which are closely allied, curiously enough, by their agglutination reactions with *B. typhosus*, all the other bacteria in this group appear to inter-agglutinate. As there are, however, minor differences in the degree of pathogenicity of these bacteria to experimental animals, and as further differences may yet be discovered between them, it is at present advisable to retain the distinctive names of the bacteria of this group.

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[1] *Semaine Médicale*, 1897.

[2] *Johns Hopkins Hosp. Bull.*, 1898 and 1900.

[3] *Ibid.*

[4] *Zeit. f. Hyg. u. Inf.*, Bd. xxxvi., 1900.

[5] *Münch. med. Wochenschr.*, 1902.

[6] *Cent. f. Bakt.*, Ref., February, 1908.

[7] *Cent. f. Bakt.*, Orig., 1908.

[8] *Zeit. f. Hyg. u. Inf.*, Bd. xii., 1908.

[9] *Ibid.*, lii., 1906.

[10] *Ibid.*

The diseases produced by this type of organism, whether derived from a previous case in man (*B. paratyphosus* B), eating the meat of diseased pigs (hog cholera), cattle (*B. morbificans bovis*), bacillus of calf septicæmia, or handling parrots (*B. psittacosis*), may be either indistinguishable from ordinary typhoid fever, or an acute gastro-enteritis, formerly known as meat or ptomaine poisoning (Kutscher,[2] Vagede,[3] Ulrich,[4] Uhlenhuth[5]. The acute gastro-enteritis type of disease is frequently found in epidemic form in Germany, and is due to eating ill-cooked meat derived usually from animals diseased by bacteria of this group. Some twenty such epidemics have occurred, and in most of these epidemics bacteria of this group have been isolated from the suspected meat, and from the patients who suffered after partaking of it. Along with the cases of acute gastro-enteritis, with diarrhœa, vomiting, headache, occasional rashes, and possibly two or three days fever, there may be present cases indistinguishable from classical typhoid, and from such cases also micro-organisms of this bacterial group have been isolated and proved to have originated the disease (Levy[6] and Fornet, Heller,[7] Vagede[8]).

The factor deciding the question whether acute gastro-enteritis or typhoid fever will be produced after eating infected meat may possibly be the amount of bacterial toxin already present in the meat eaten. This toxin acts as a gastro-intestinal irritant, vomiting and peristalsis are set up, and the obnoxious bacteria are got rid of. If few or no toxins are present in the diseased meat, the infecting bacteria are not got rid of by vomiting and purging, and if the body resistance is impaired at the time, typhoid fever may be induced (Levy and Fornet). Meat poisoning epidemics were at one time considered to be due to the ingestion of substances called ptomaines, obscure products of meat decomposition. There is no doubt that nearly all these cases of epidemic gastro-enteritis are due either to infection by bacteria of the typhoid-coli group, or to a saprophytic anaërobic organism, the *B. botulinus.* Botulism is the condition produced by the latter organism, and is characterised by acute disease of the central nervous system, including paralysis of the ocular muscles, larynx, pharynx, &c., and is readily distinguishable from the condition set up by the paratyphoid B group of bacteria. I shall refer again to this group of bacteria when dealing with the part played by animals in the spread of typhoid diseases, and shall now deal with the last group of organisms mentioned in the table, viz., the group *B. coli communis.*

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[1] Meinicke, *Zeit. f. Hyg. u. Inf.* Bd., lii., 1906 (drittes Heft).

[2] *Ibid.*, Bd. lv., 1906.

[3] *Klin. Jahrb*, 1905.

[4] *Zeit. f. Hyg.*, 1903.

[5] *Cent. f. Bakt.*, April 10th, 1906.

[6] *Cent. f. Bakt.*, May, 1906.

[7] *Ibid.*, xliii., January, 1907.

[8] *Klin. Jahrb.*, 1905.

I have already described the cultural reactions of *B. coli communis*, or at least one strain of it, for unfortunately there are at least five varieties of this group, some of which approach in cultural characters more closely to the *B. typhosus.* The strain, the reactions of which I have described, is the most active fermenter of sugars in the typhoid-coli group of bacteria.

As regards pathogenicity, *B. coli* has been isolated from cases indistinguishable from typhoid fever (Montier[1]). Such a case occurred at the Military Hospital at Roberts' Heights this year. *B. coli* is largely responsible for the feverish diarrhœa of infants, and has caused at least one epidemic of enteritis, the infection being water-borne in this instance (Levi della Vide,[2] Vicenzi).[3]

This closes the first part of my paper, which refers to the question of the complex nature of typhoid etiology, and I hope I have succeeded in my endeavour to point out that in typhoid we have a disease of protean nature, which may be induced by any one of several groups of allied but distinct bacteria. I shall now take up the question of the part which animals and man play in disseminating typhoid.

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[1] *Cent. f. Bakt.*, May 16th, 1907.

[2] *Cent. f. Bakt.*, February 21st, 1907.

[3] *Ibid.*

## THE PART PLAYED BY ANIMALS AND MAN IN THE SPREAD OF THE TYPHOID GROUP OF DISEASES.

In the fifth column of the table will be seen the heading, "Various Animal Hosts." Closer examination of the contents of this column will make it evident that practically all of the bacteria of the typhoid-colon group play an important part in the life and diseases of many animals besides man. The names of several diseases of the bacteria of the fourth group are, indeed, derived from the animal diseases which they have produced; for instance, the bacteria of hog cholera and of cattle disease, *B. psittacosis*, &c.

The belief is gaining ground, especially in Germany, that the direct spread of enteric from man to man, or from animal to man, accounts for more of the endemic form of this disease than has hitherto been suspected, and, if this widespread disease is to be stamped out, far greater attention must in future be paid to these avenues of infection than has been the case heretofore. We have bacteria in this group which may produce disease in a domestic animal or typhoid in man, and this human typhoid may be due to eating the flesh of the animal so diseased. These facts cast, I think, a new light on the question of typhoid etiology, and, in order to further study them, I will now deal with the animal distribution of each of the organisms of the typhoid-colon group in turn.

The *B. typhosus* has not yet been proved to have a widespread distribution in animals. Typhoid bacilli, however, have been found in the spleen abscess of a cow, and in a few instances in the tissues of cattle (Levy and Fornet). Though milk has been proved to have conveyed typhoid fever, I do not know of an instance where the typhoid bacteria were proved to have been derived from a diseased cow. But this question has scarcely yet been seriously investigated, as it is only lately that the possibility of typhoid spread through the agency of diseased animals has been realised. The next bacterium is *B. paratyphus* "A." This producer of typhoid disease in man has been isolated from the intestines of many domestic and other animals—dogs, pigs and guinea-pigs (Morgan[1]). The bacillus has, up to the present, been so rarely isolated from disease in man that the question of its transmissibility to the human body from animals can only be decided by future research. The last group but one of bacteria I shall deal with, the *B. paratyphus* "B," is peculiarly interesting; here we have six species of bacteria, which are apparently identical as regards their cultural reactions, and with one exception (the second meat-poisoning group) as regards their agglutination reactions also. Of this group of bacteria the first isolated from disease in man was called Gärtner's bacillus, after its discoverer, who isolated it from patients suffering from meat poisoning. When similar organisms are isolated nowadays from human typhoid or meat poisoning they are usually spoken of as bacteria of the paratyphoid " B " group. Practically identical organisms have been found associated with hog cholera, enteritis in oxen, and septicæmia in calves (*B. morbificans bovis* bacillus of calf septicæmia). A bacillus of this type has also been isolated, which is believed to cause an enteritis in horses (Trömsdorf,[1] Kütscher and Meinicke,[2] Bohme,[3] Wasserman [4]).

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[1] *British Medical Journal*, January 10th, 1905.

Through eating the imperfectly-cooked flesh of much-diseased domestic animals frequent epidemics of meat poisoning have occurred in man, the disease induced being generally an acute gastro-enteritis, occasionally typhoid fever. Bacteria of the *B. paratyphosus* " B " type have been isolated from the suspected meat and from the affected persons, and the blood sera of the patients have been found to agglutinate these bacteria, proving the source of the disease to be the infected meat (Frome [5], Heller [6]). The best-known epidemics of meat poisoning are those named in the table, and so called either from the place of origin or name of the discoverer. The bacteria isolated from all these epidemics are identical in cultural reactions with any and all of the others of this group, but owing to differences in agglutination reactions they have been divided into two groups (Kütscher and Meinicke).

The first group includes the epidemics named after Aertyck, Meirelbeck, Günther, Calmphout, Smith and Serault). The bacteria isolated from the diseased flesh and the human patients in these epidemics were found to have similar agglutination reactions with *B. paratyphosus* " B," and the bacilli of hog-cholera, cattle disease, *B. psittacosis* and mouse typhoid; it is probable that all these bacteria are of one and the same species. The bacteria isolated from the epidemics named after Gärtner, Moorceilli, Brussel, Gent, Rumfleth and Haustadt, while culturally identical with the other species in group 4, are allied, curiously enough, through agglutination reactions to the *B. typhosus* (Kütscher and Meinicke). The psittacosis bacillus, a bacterium indistinguishable from all those of group 4 in cultural characters, and from all but the second meat-poisoning group of bacteria in agglutination reactions, has caused gastro-enteritis, and even typhoid fever, among dealers in parrots. Similar bacteria have also been isolated from dogs, guinea-pigs and mice (*B. typhi murium*), animals closely associated with man (Smallman,[1] Klimenko,[2] Tromsdorf,[3] Morgan[4]. The last member of the typhoid-colon group of bacteria I shall deal with is the *B. coli communis.* This common and widespread organism is present in the intestinal tract of most animals. It occasionally produces gastro-enteritis and a disease like typhoid in man.

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[1] Congress in Meran, 1905.

[2] *Zeit. f. Hyg. u. Inf.*, Bd. lii., 1906.

[3] *Ibid.* (erstes Heft).

[4] *Zeit. f. Hyg. u. Inf.*, lii., 1906 (zweites Heft).

[5] *Cent. f. Bakt.*, April, 1907.

[6] *Ibid.*, January 17th, 1907.

I have called attention to the fact that bacteria similar to those which cause typhoid disease in man are the common producers of animal disease also; further, that man may be affected by attacks of gastro-enteritis or typhoid fever by partaking of the meat of such diseased animals. I have also shown that animals closely in association with man, such as farm animals, horses, dogs, parrots, mice, &c., are all liable, either normally or when diseased, to harbour bacteria in their intestinal tract or tissues, which may set up typhoid disease in the human subject.

## THE PART PLAYED BY MAN IN THE DISSEMINATION OF TYPHOID.

As I have already shown, man is liable to infection from any one of these groups of bacteria, the disease produced being either a localised affection, or, what is more usual, a septicæmia.

Wherever the typhoid bacillus obtains an entry into the circulation, it is carried along, among other directions, to the liver and gall-bladder. In bile, the bacteria of the typhoid-colon group find a medium so suitable for their continued existence that they will often survive here when they have perished elsewhere in the tissues. These facts have been established both by *post-mortem* findings in man and by experiments in animals. Doër,[5] Foster and Kayser,[6] and others have found that, when bacteria of the typhoid-colon group are injected into laboratory animals, the gall-bladder is early affected and remains affected long after other portions of their tissues. In *post-mortem* examinations on typhoid disease in man, a pure culture of typhoid can usually be isolated from the bile, and Foster and Kayser have found the gall-bladder infected by typhoid bacilli in persons long recovered from typhoid, even in people who give no history of a typhoid attack. A typhoid-infected gall-bladder may constantly reinfect an intestinal tract free from the germ. While this fact is of little importance from the affected person's point of view, it is a serious business for that person's neighbours (Foster and Kayser).

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[1] JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, July, 1905.

[2] *Cent. f. Bakt.*, July, 1906. [3] Congress in Meran, 1905.

[4] *British Medical Journal*, January 10th, 1905.

[5] *Cent f. Bakt.*, xxxix., October, 1905.

[6] *Ibid.*, Ref. June.

We have long known that during the acute stage of typhoid fever the stools and urine are infective. The danger to nurses and neighbouring patients of this source of infection has long been recognised in military hospitals, where enteric patients are kept in enteric wards, and their excreta carefully sterilised. What is less known is that, largely through typhoid-infected gall-bladders, the stools of recovered typhoid patients may be infective for months, even years. It has been estimated that typhoid bacilli may be isolated from enteric stools in 25 to 30 per cent. of the cases in the first three weeks, 10 to 15 per cent. in the next two months, 4 or 5 per cent. after the third month, and finally that some 1·5 per cent. of the cases become regular carriers (Dregalski, Brion and Kayser). Working on typhoid stools in the Army Headquarters Laboratory, Pretoria, I have had similar results. The latest period, however, at which I have isolated the *B. typhosus* from stools, has been the third month of convalescence from typhoid fever. Some healthy persons who appear never to have had typhoid, pass bacilli of the typhoid group in their stools. It is difficult, however, to be certain that they have never had typhoid, because many of the manifestations of the disease are so utterly unlike the clinical picture. Typhoid bacilli are present in the urine in some 30 or 40 per cent. of severe cases, and in about 15 per cent. of all diagnosed cases of typhoid fever. The bacilluria may last for months and form a very serious source of infection (Vas,[1] Lesseur,[2] Wassiljef).[3] Now, when we come to think of the large number of people who suffer from recognised typhoid, and then remember how great the chances of typhoid being unrecognised are, owing to its protean character, we must be impressed by the potentiality of man as a typhoid distributor. I do not now refer to the infection of a water supply by typhoid patients or bacilli-carriers, but to the direct communication of the disease from one man to another (Minelli,[1] Netter and Liefman,[2] Klinger, Levy and Weekes[3]). In Germany especially, this factor in the spread of typhoid is receiving the attention it deserves. Endemic typhoid is looked upon as contracted from infected "*Typhushäuser*" and "*Typhusträger*"—"typhoid houses" and "typhoid carriers." Cases are constantly coming to light of a bacilli-carrier in a house infecting the other inmates of that house. In a recent and specially remarkable case, a woman confectioner, who had been a bacilli-carrier since an attack of typhoid twenty-four years before, infected all the assistants in the shop (nine) who used the same water-closet. In domestic life or on campaigns, think of the possibilities of typhoid spread from the handling of bread alone; and the origin of more than one epidemic of typhoid can be traced to milk, infected through a bacilli-carrying cow-milker (Klein,[4] Conradi,[5] and Kayser). There is also one other way in which, in my opinion, a person may be infected by typhoid, *i.e.*, by auto-infection. We know that there are often in the intestinal tract of healthy people, bacteria capable of causing typhoid. Why should not such a person, when for some reason his vitality is lowered, contract the disease? Diphtheria, pneumonia, boils and abscesses, are largely due to auto-infection following lowered bodily vitality; why not enteric? I throw this possibility out as a suggestion.

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[1] *Cent. f. Bakt.*, February, 1907.

[2] *Ibid.*, Ref. March, 1907.

[3] *Zeit f. Hyg. i. Inf.*, Bd. lv., 1907.

## SUMMARY.

(1) Typhoid fever must be looked upon as a group disease. The classical symptoms of typhoid are but one of the manifestations of a disease which may at other times simulate pathological conditions utterly unlike it.

(2) The etiology of this disease is as complex as its symptomatology, for there are a number of allied but distinct species of bacteria which may produce disease indistinguishable from typhoid fever.

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[1] *Cent. f. Bakt.*, xli.

[2] *Ibid.*, February 21st, 1906.

[3] *Cent. f. Bakt.*, xliii., March 5th, 1907.

[4] *Cent. f. Bakt.*, Orig., xxxviii., March 29th, 1906.

[5] *Ibid.*, November, 1905.

(3) Most of the varieties of bacteria composing the typhoid-colon group are found in apparently healthy animals, and many diseases among domestic and other animals are caused by bacteria which may produce typhoid in man. Further, typhoid has been induced in human beings by eating the improperly-cooked flesh of such diseased animals.

(4) The danger of typhoid being spread by direct infection through the contaminated excretions of unrecognised typhoid cases is a real one. A certain percentage of those convalescent or even recovered from typhoid become bacilli-carriers, and cause endemic typhoid by infecting houses, food, &c.

The conclusions to be drawn from these facts are, I think:—The technique of cultures from the blood in disease has been so much simplified that this method may be adopted with advantage in all cases of doubtful pyrexia. The other method of serum (Widal) diagnosis, though still very useful, has many drawbacks. Agglutinins may not be formed in typhoid blood till late in the disease;. they may be transient or even altogether absent. Much confusion may also arise if the serum under examination is taken from a patient suffering from disease caused by organisms allied to the *B. typhosus*. I am heretic enough to believe that endemic typhoid is as largely produced by house infection or transferred from man to man, or animal to man, as epidemic typhoid is due to infected water. There is never epidemic without endemic typhoid, and the way to prevent the first is to remove the second. This is the method in which the present campaign against typhoid in Germany is being conducted, and it is also the method we adopt in the Army. Animals may play such a large part in the transference of typhoid that the segregation and destruction of diseased animals on farms, and the close supervision of abattoirs, must be undertaken more energetically than ever before.

TABLE SHOWING THE CHARACTERISTICS OF THE TYPHOID-COLON GROUP.

| Name of Organism | Pathogenic Effects upon Man | Morphology | Cultural Reaction | | | Agglutination | Various Animal Hosts |
|---|---|---|---|---|---|---|---|
| | | | Litmus milk | Neutral red glucose | Mannite solution | | |
| *Bacillus fæcalis alcaligenes* .. .. .. | Has induced conditions indistinguishable from classical typhoid | All of these bacteria are short motile rods. Paratyphoids are more actively motile than the typhoids. They are readily stained by aniline dyes, but do not retain the stain in the method of Gram | Blue .. .. | Unchanged .. | Unchanged .. | In the case of these bacteria there is usually marked agglutination with the serum of a man or animal suffering from the diseases produced by them. (*Specific agglutination.*) They are also agglutinated to a much slighter extent by the blood sera of men or animals suffering from diseases produced by the other bacteria of the typhoid-colon group (*Group agglutination.*) | Man |
| *B. typhosus* .. .. | Most commonly induces typhoid fever. May cause abdominal symptoms without fever or *vice versa.* Has induced conditions simulating sore throat, bronchitis, pneumonia, hepatitis, cholecystitis, appendicitis, meningitis, general local affections, such as abscesses, middle-ear diseases, adenoids, &c. | | Unchanged or but slightly altered | Unchanged .. | Acid, no gas .. | | Has been found in splenic abscesses in cows also in tissues of men, oxen and cattle. |
| *B. paratyphosus A* .. | May induce a condition chemically indistinguishable from typhoid fever. The cases, however, are mild. *Post mortems* show the patches of Peyer not affected, and mesenteric glands and spleen less enlarged than in typhoid | | Turned a permanent pinkish | Gas is evolved and slight fluorescence; disappearing in a few days | Acid, little or no gas | | Man, cattle, sheep, dogs and pigs. |
| *B. paratyphosus B* ..<br>Meat poisoning bacilli *Group A.*<br>Aertyck, Meirelbeck, Serault, Gunther, Calmphout, Smith *Group B.*<br>Gärtner, Morcelli, Brussel, Gent, Brugge, Rumfleth, Haustadt<br>*Hog-cholera Group:*<br>*B. morbificans bovis* (calf septicæmia)<br>*B. typhi murium*<br>*B. psittacosis*<br>*B. para-coli* | Produce either an acute gastro enteritis or a condition clinically indistinguishable from typhoid fever<br>Both varieties may occur in the same epidemic | | Turned first red (acidity), later a deep blue (alkalinity) | Much gas and marked permanent fluorescence | Acid and gas | | Man, cattle, sheep, dogs and pigs.<br>Found in the meat of pigs, oxen, sheep, &c. |
| *B. coli* | May produce typhoid fever or enteritis | | Turned red and coagulated | Very much gas and marked fluorescence | Acid and much gas | | Man, most mammals. |

# THE RED CROSS OF GENEVA.

By Colonel H. HATHAWAY, Army Medical Service, and Major R. J. BLACKHAM.
*Royal Army Medical Corps.*

[This article is written as the introductory chapter of a short handbook of Ambulance Transport projected by the authors.

It has been suggested that the individual chapters might be published in the Corps Journal, so that the writers might have the valuable comments and criticism of their brother officers on their work.]

> "La bannière de la Convention de Genève marchera dorénavant auprès des armées en campagne ; c'est l'humanité même qui la porte ; elle ne se la laissera pas enlever : *In hoc signo vinces !*"—Maxime du Camp de l'Académie Française.

The transport of the sick and wounded is a matter of supreme importance not only to the officers of the medical services of the Regular and Territorial Armies, but to the ever-widening circle of voluntary medical aid societies designed to aid the sufferers in modern warfare. We think, therefore, that we cannot adopt a better introduction to a handbook of this character than to give some account of the origin of the Red Cross which is the distinguishing badge of all ambulance transport in war. We are led to do so because it is obvious that the origin of this universal badge is not generally recognised, and that the greatest confusion exists in both the military and civilian mind as to its origin and meaning.

During the great campaign of 1859, when Napoleon III. undertook to free Italy "from the Alps to the Adriatic," a Swiss country gentleman named M. Henri Dunant, found himself involuntarily within the theatre of war and witnessed the terrible carnage at the great battle of Magenta, which left 10,000 Austrians and 4,000 French and Piedmontese dead and wounded on the field, and gave its name to a French dukedom and to a new dye! He also became a spectator of the frightful horrors of Solferino, which lasted fifteen hours and left as victims 38,000 dead and dying. His exceptional experience showed him that the regular medical services of even what were then considered to be the greatest armies of the world were totally inadequate to cope with the large number of wounded in modern warfare, and that everything was lacking for the poor wounded soldiers of France and Austria—doctors, instruments, surgical appliances, food, water, and even air ; for the exhalations on those terrible battlefields were mephitic and loathsome in the extreme. This humane and enlightened gentleman came to the conclusion that two points were essential for the provision of prompt and adequate succour to the wounded in war, viz.:—

(1) International recognition of the neutrality of all hospitals, and of the *personnel* and supplies of ambulances for the use of the sick and wounded of belligerents.

(2) The organisation of voluntary medical relief societies for the aid of the public medical services under the stress of war.

The first of these points was not original, as it had been advocated by an eminent Italian surgeon named Dr. Palaschiano in a paper entitled *La Neutralità dei feriti in tempo di Guerra*, read before the Academia Pontraneani in 1861, but the latter was entirely M. Dunant's own idea. His experience with the French and Austrian armies, as recorded in a pamphlet entitled "Un Souvenir de Solferino," aroused a considerable amount of interest. Dunant was received by the Emperor Napoleon III. and General MacMahon. The sympathy of the French Emperor was at once enlisted, and he himself suggested that the inhabitants of a country which gave help to the wounded should be accorded neutrality. The movement spread, and, thanks to the continued efforts of the Swiss enthusiast, an unofficial Conference of persons interested in the subject was held at Geneva in 1863, under the auspices of a charitable association of that city known as the "Société Genevoise d'Utilité Publique." This Conference resolved to encourage the formation of societies in every country for the purpose of offering aid to the military medical services in the field. So far what had been accomplished amounted to merely an organisation of public philanthropic effort, but a suggestion made by the Conference was destined to produce far-reaching results. The Swiss Government was induced to invite the Powers to a diplomatic Conference with a view to the "neutralisation" by permanent international agreement of persons and appliances devoted to the relief of the sick and wounded in belligerent armies. Accordingly, on August 8th, 1864, a Conference, attended by delegates from fourteen countries, was held at Geneva and a Convention drawn up which became the basis of accepted international law with reference to the sick and wounded.

The terms of the Convention provided that all military ambulances and hospitals, and all persons employed therein, are to be considered neutral, and, as such, respected by belligerents so long as any sick and wounded are under treatment, but should they be held by a military force their neutrality terminates. The term "field ambulance," which has now been adopted for the service unit of the British Medical Service, is a vast improvement on the old terms of "bearer company" and "field hospital," which had to be specially construed to fall within the provisions of the Convention. The term "hospital" is taken to cover all fixed or stationary hospitals on the lines of communication or at the base. The postings of such pickets or sentries as may be necessary for the protection of an ambulance or hospital does not interfere with its neutrality, but in the event of its capture by the enemy all combatant attachés of the unit become prisoners of war. Persons employed in the medical units are not prohibited from bearing arms, or using them for their own protection, nor from receiving the arms of the sick and wounded admitted for treatment (Article 8, Convention of 1906). The arms of all patients should, however, be transferred to a combatant unit as soon as is reasonably possible (Laws and Customs of War, Holland, p. 19).

The 18th Article of the New Convention provides that the heraldic emblem of the red cross on a white ground shall be retained as the distinctive emblem of the medical service of armies. It must in every case be accompanied by the national flag of the country to which the unit belongs (Article 21). An armlet or brassard is also allowed for individuals neutralized, but the delivery of this is left to the discretion of the military commander. The arm badge must be stamped by the competent military authority, and accompanied by a certificate of identity in the case of persons who are attached to the military service of armies, but who have no special uniform.

Before 1864 there had been no distinctive badge for designating the medical organisation forming part of a field army, and the device, the employment of which is enjoined by this article of the Convention, is borrowed from the arms of the Swiss Confederation, reversing the colours. It was not, as is generally supposed, originally designed for the 1864 Convention, but had already been adopted by the "Sociétés de Secours" which came into existence after the unòfficial Conference held in Geneva in the previous year.

The Red Cross has, therefore, become the universal badge of the medical service of every civilised army and navy, with the exception of those of Turkey and Persia, and has been used as such in every war since 1864, with the exception of the Russo-Turkish war of 1876, and the Græco-Turkish war of 1897. In these wars, owing to the prejudice against the Cross which exists amongst Mussulmans, Turkey was obliged to adopt a red crescent for her own medical service; but, while doing so, she undertook to respect the Red Cross in the service of the enemy.

At the Conference of 1906, although not actually embodied in the Convention, it would appear that the principle of allowing Turkey to employ the Red Crescent, and Persia the Red Lion and Sun on a white ground, in each case as a distinctive ambulance flag, was accepted by the delegates.

Until 1906 the position of the Red Cross Societies was somewhat anomalous, as they were not mentioned in the Geneva Convention of 1864, and its eight articles applied exclusively to the ambulances and hospitals of the belligerents, whether forming part of their regular military organisation or affiliated to it as the result of private effort. The ambulances and hospitals of Red Cross or Aid Societies, unless so affiliated and under the control of a belligerent commander, did not enjoy any of the benefits conferred by the Convention. This is, however, no longer the case, as Articles 10 and 16 of the new Convention of 1906 expressly recognise Red Cross Societies.

All voluntary aid in the field must of necessity be supplementary to the regular medical services of the army and navy, as the primary responsibility for providing for the casualties of war must rest on these two branches of the public service, and on them alone. A Red Cross Society can, however, perform great service to a belligerent and to humanity, by providing additional medical comforts and general help in ambulance matters which may reasonably be considered to be beyond the scope of official bodies.

It is, we think, generally accepted that in the matter of *personnel* it is well-nigh impossible to maintain the medical service of the army of any country, in time of peace, at the standard demanded by the stress of war. In the event of war, especially when some fundamental national sentiment is involved, or believed to be involved, it is found that the public come forward with the utmost generosity with offers of help, chiefly in the direction of rendering aid to the sick and wounded. It is the duty of the Red Cross organisations to act as agents to collect and retain the financial and practical assistance which national enthusiasm produces, till it can be utilised by the military or naval authorities. All such societies acknowledge as their supreme authority the International Red Cross Committee, which has its headquarters at Geneva, the birthplace of the Red Cross, and is vested by international agreement with the power to examine the credentials of all new organisations before admitting them as fully accredited members of the family of Red Cross Societies. This Committee arranges for international conferences and performs other important duties.

Red Cross Societies sprang into existence in every nation in Europe soon after the first Geneva Convention. France and Prussia were amongst the first in the field in 1864, Russia followed in 1867, while Great Britain was almost the last, as it did not form the first of its Aid Societies until 1870.

The present wealth and position of these European societies and the extent to which they have grown may be judged from the attached table. Our table was constructed prior to the publication of Lieutenant-Colonel Macpherson's excellent table in the *Journal of the Royal United Service Institution* in August, 1907.

"The National Society for Aid to the Sick and Wounded in War" was the name of the first Red Cross Association to be established in England. Of its foundation, Lord Rothschild, the chairman of the society, thus spoke at a meeting on July 17th, 1905: "When the Franco-German war broke out in 1870, that gallant soldier, the late Lord Wantage—who had planted the colours of his regiment on the heights of the Alma, for which he received the Victoria Cross, who had served with distinction all through the campaign in the Crimea, who knew from experience the misery and sufferings of wounded and sick soldiers in a campaign, and who was aware of how little was done in those days to alleviate the hardship of men fighting for the honour and glory of their Sovereign and country—took advantage of the rules of the new Geneva Convention to start the society over which he long presided, namely the National Society for Aid to the Sick and Wounded in War. His Majesty the King was the patron of that society, and His Royal Highness the Duke of Connaught was one of the trustees."

The great work accomplished by this society has been worthy of its distinguished founder, and of the country in which it originated. From the time of its foundation in 1870 till 1905, it expended nearly £500,000 in assisting the sick and wounded in war. In the Franco-German war it provided over £250,000 in supplying transport, food, clothing, medical stores, and grants in aid of local funds. It employed in that campaign nearly 200 agents, surgeons, nurses, &c., and established more than a dozen central depôts in France and Germany for the distribution of stores. It accomplished similar good services in the Turco-Servian and Russo-Turkish wars, as well as in other European campaigns. It furnished aid in the Zulu campaign of 1879, and in the Boer war of 1881. In the Egyptian campaign of 1884-1885 the society expended £33,920 in the employment of surgeons and nurses, in the provision of steamers, launches and dahabeahs, and in the forwarding of medical and surgical supplies to the front. The amount expended by the society in the South African war, 1899-1902, was about £162,096. Twenty-one commissioners and agents were employed, the hospital ship "Princess of Wales" was chartered, and the hospital train "Princess Christian" purchased. The work in this war was carried out in connection with, and under the direction of, the Central Red Cross Committee.

The "Central British Red Cross Council" came into being in 1898. In that year, at the request of the Secretary of State for War, representatives of the National Society for Aid to the Sick and Wounded in War, of the St. John Ambulance Association, and the Army Nursing Service Reserve were invited to take part in an informal Conference with a view of considering the advantages that would be derived in time of war by bringing societies in touch with the Army Medical Service in time of peace.

On January 19th, 1899, the Secretary of State for War notified his official recognition of the Central British Red Cross Committee. On November 27th, 1902, the Foreign Office notified all foreign chancelleries that the Central British Red Cross Committee was the only body authorised to deal with Red Cross matters throughout the Empire. In May, 1904, the name of the Committee was altered to the "Central British Red Cross Council." The *personnel* of the Council was finally composed of three representatives of the National Aid Society; of two, respectively, of the St. John Ambulance Association, the Army Nursing Service Reserve, and the St. Andrew's Ambulance Association; of three representatives of the War Office, and one of the Admiralty. The admirable work carried out by the Central British Red Cross Council in the late South African war is fully detailed in the report of the Central British Red Cross Committee.

In 1905 was inaugurated the British Red Cross Society, under the presidency of Queen Alexandra. It is the outcome of the fusion of the "Central British Red Cross Council" and the "National Society for Aid to the Sick and Wounded in War," as Their Majesties the King and Queen considered it desirable that the Red Cross movement in the Empire should be represented by one society, which should co-ordinate all associations concerned with the succour of the sick and wounded in war.

In addition to this new Red Cross Society, which is, of course, in its infancy, there are two other bodies engaged in active ambulance work in Great Britain. These are (1) the St. John

## TABLE.

### RED CROSS OF GENEVA, SHOWING PARTICULARS AVAILABLE OF RED CROSS SOCIETIES OF THE SIX GREAT POWERS.

| Country | Membership | Total funds | Annual revenue | Medical profession | Schools for training nurses | Trained nurses available | Field medical units | Hospital ships | Hospital trains |
|---|---|---|---|---|---|---|---|---|---|
| *Great Britain:* | (*a*) | (*b*) | (*c*) | (*d*) | (*e*) | (*f*) | (*g*) | (*h*) | (*i*) |
| (1) British Red Cross Society | No statistics available, as Society has been formed so recently. | | | | | | | | |
| (2) St. John Ambulance Association | 70,000.. .. | Financed by Order of St. John | £11,000 | 2,000 surgeons.. | — | — | 8 to 10 permanent bearer companies. Naval and military home hospital reserve being formed | There is no voluntary equipment for hospital trains or hospital ships available in peace time. | |
| (3) St. Andrew's Ambulance Association | — | — | Nearly £5,000 | — | — | 17,000 all ranks | Has scheme for military and naval home hospital reserve | | |
| (4) Army Nursing Reserve | | Only arranges for supply of nurses. | | | | 621 lady nurses | — | | |
| *France:*<br>(1) Société de Secours aux Blessés Militaires; (2) L'Union des Femmes de France; (3) L'Association des Dames Françaises | 50,000 .. | £468,547 | £14,000 | 806 surgeons | 36 dispensary schools. Red Cross hospital is being built in Paris | Over 2,000 .. | 26 field hospitals, 88 railway infirmaries, 328 auxiliary hospitals. The total provision is for 18,742 sick and wounded | Two hospital ships were sent to China in 1900 | Material for equipping hospital trains exists. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *Germany:*<br>(1) German Red Cross Territorial Societies. | Male members, 94,780; lady members, 293,222 | £462,350 | £60,000, nearly | Civilian doctors: 53 for field army and 460 for army of occupation; 1,300 medical corps; 22,000 trained men | Volunteer ambulances patrol streets and practise on Sundays | Female helpers, 933; volunteer nurses, 2,515, of whom 865 for field army and 1,650 for army of occupation; professional male nurse contract for 862; volunteer nursing association, 6,986 members; male nurses, 1,255 for field army and 1,092 for army of occupation. Unskilled helpers in Samaritan Society, 144 | Hospitals to accommodate 11,951: 53 can provide commissariat, &c., of reserve Government hospitals, but 83 only with assistance; 815 sanitary transport columns; 577 rest stations; 518 branches have arranged with families to take in sick and wounded. The total provision is for about 40,000 sick and wounded | Material for 3 ships and 2 barges | Has material for 147 coaches for railway, 5 for light railway. |
| (2) National Society of German Women | 312,091 .. | — | Nearly a million dollars. Expenditure equals receipts | — | 85 parish nursing stations, 69 hospitals—15 devoted to training of Red Cross sisters; 3 hospitals in German East Africa, 8 sisters in China, 57 Red Cross sisters in German colonies, 25 in East Africa, 24 in S.W. Africa | There is an institution for pensioning nurses. 1,254 Red Cross sisters | *Nil* .. .. | *Nil* .. | *Nil.* |
| (3) Knights of St. John and Teutonic Knights | Statistics not available; but these ancient Orders of Knighthood take a practical interest in ambulance work in Germany and Austria. | | | | | | | | |

RED CROSS OF GENEVA, SHOWING PARTICULARS AVAILABLE OF RED CROSS SOCIETIES OF THE SIX GREAT POWERS.—*Continued.*

| Country | Membership | Total funds | Annual revenue | Medical profession | Schools for training nurses | Trained nurses available | Field medical units | Hospital ships | Hospital trains |
|---|---|---|---|---|---|---|---|---|---|
| | (*a*) | (*b*) | (*c*) | (*d*) | (*e*) | (*f*) | (*g*) | (*h*) | (*i*) |
| *Austria—Hungary* | 100,000 | £494,915 | — | 723 surgeons, 25 pharmacists | Hospitals for this purpose are established | 900 | Provision for 27,769 sick and wounded, 2 field hospitals, 14 waggons, 33 transport columns, 15 ambulances | One | Material for equipping. |
| *Italy:* La Croce Rossa Italiana | 5,800 | Cash, £182,960, material, £104,000 Total, £286,960 | £12,820. Expended: Cash, £7,200; material, £4,000. Total, £11,200 | 520 directing staff, 2,000 working staff for hospital; 44 railway station infirmaries | Information not available | Exact figures not available | 65 dressing stations, 8 hospitals of 100 beds, 3 hospitals of 50 beds, 64 mountain ambulance corps, material for 3 hospitals of 50 beds, 64 war hospitals without beds—value £60,000 | Two — one with 25 beds; one river hospital | 15—one in Sicily. |
| *Russia* | About a million | £1 200,000 before war | About £100,000 | Several hundred doctors are attached | 42 hospitals, 83 dispensaries, 10 asylums for widows and orphans of wounded soldiers | Several thousands | A large number; exact figures not obtainable | Hospital ships were used in late war | 15 in the war with Japan. |

Ambulance Association and Brigade; and (2) the St. Andrew's Ambulance Association. Both are essentially Red Cross Societies, and have rendered important and memorable service to both belligerents in the South African war. The first-named body is of special interest. It is officially styled the Ambulance Department of the Order of St. John of Jerusalem, and came into existence in 1877.

The Order of St. John has its headquarters at St. John's Gate, a portion of the ancient Priory of St. John in the city of London, and in some thirty years has developed its ambulance department in a very remarkable manner. From persons who have obtained proficiency certificates of the ambulance department has been organised a further development of the Order called the St. John Ambulance Brigade, which forms a distinct branch under a special Chief Commissioner. The Brigade is formed of divisions consisting of at least sixteen individuals, with an honorary surgeon.

From these divisions is being formed an organisation called the "Military Home Hospitals Reserve of the British Army," which will be recruited, as far as officers and rank and file are concerned, from the St. John Ambulance Brigade. It is designed to take over the whole of the military hospitals in the United Kingdom in the event of a great war, and thus set free the whole *personnel* of the corps for service at the front.

Such, briefly, is the present position of the Red Cross organisation in this country. We hope that we have succeeded in showing, in this necessarily limited review of a great subject, that the badge worn by the men of our corps is an honourable and *military* distinction of a truly international character, which symbolises the greatest humanitarian movement the world has ever known. And in conclusion, we venture to predict that whilst other great schemes of international reform have often a mere temporary vogue, the Red Cross of Geneva, and the great work of which it is the emblem, will never pass away while Human Charity remains to us, or sympathy with Human Suffering endures.

# THE ORGANISATION OF MILITARY HOSPITALS.

By Lieutenant-Colonel S. WESTCOTT, C.M.G.
*Royal Army Medical Corps.*

The rapidly progressive evolution of military hospitals during recent years, and the encouragement given to the healthy development of initiative among all ranks, have doubtless led to diversity of practice among officers commanding hospitals. It is for this reason that I venture to give a brief account of a system which I have gradually evolved since 1899.

Briefly, it is an organisation of: (1) Sections for discipline and interior economy. (2) Separate departments for the treatment of the sick. (3) Co-ordination and co-operation with medical practitioners, whether belonging to the sister services, or civilians. (4) Mental labour for the officers, and clerical and manual labour for those serving under them, all co-ordinated by the commanding officer.

I was long ago convinced that the individual medical officer could not be an expert in every subject of his profession, and that better results were to be obtained by a "specialist" system of organisation, in which hospitals are divided into wards or sections, to which the various classes of disease are sent for treatment in separate departments, by specialists when they are available, or by those best qualified when there are none. In this way officers become enthusiastic, and, by constant practice, expert, to the manifest advantage of the patient, and to those interested in the study and advancement of any particular branch of medical science.

In a small hospital, with perhaps only one medical officer, this system may seem impossible, but it is not really so. The plan I have always adopted to carry out my views under these circumstances consists in the cultivation of friendly relations with the medical practitioners of the nearest towns on a basis of mutual help, and I have invariably found them animated by a patriotic spirit and a keen desire to assist, a debt I gratefully acknowledge.

In the case of very large hospitals there is no difficulty. It fell to my lot during the South African War to consecutively organise and command four hospitals of from 700 to 2,000 beds, and I had over thirty officers from whom to select my specialists. In medium-sized hospitals there cannot be a specialist for each subject, but the principle of doing the very best for every class of patient can still be observed by consulting the ever increasing specialists of our Corps, or when they are too far away, by mutual co-operation with the other medical services, or with civil practitioners.

I will mention another direction in which evolution is progressing—the duties of junior medical officers should not be limited to attendance on the sick. My hospitals are divided into sections, each with a medical officer in command, with the position and powers of an officer commanding a company, and a complete and separate staff of officers, warrant officers, nursing orderlies, and Army Hospital Corps men, for whose discipline and interior economy he is responsible.

Officers are encouraged not to waste time in clerical work, but to utilise their warrant officers for this work. For instance, the assistant surgeon of a ward is to enter the thousands of words daily on the diet-sheets which are necessary to procure a meal for the sick; he is to take the diet-summary with him during the visit of his officer and enter any alteration ordered in it, afterwards correcting the diet-sheet for the initials of the officer each day. He is to prepare spot maps of every preventable disease in order that its progress may be seen at a glance. He is to indicate by coloured pins on a ward chart the daily changes in bed occupation, and to keep all registers, &c., up to date and ready for checking and signature by his officer.

The following extracts from the Standing Orders of my present Command, the Station Hospital, Mhow, Central India, may perhaps be of interest:—

(1) The Station, Section, and Family Hospitals will be organised on lines similar to those adopted by London hospitals.

(2) Certain diseases will be treated in separate departments.

(3) There will be "in-patients" and "out-patients" in each department.

(4) The following will be separate departments: Surgery; enteric fever; dysentery; malaria; diseases of the eye; diseases of the ear; dentistry; venereal; women and children.

(5) The following appointments will be made: Registrar; anæsthetist; bacteriologist; compounder.

(6) The Station Hospital will be divided into four sections: No. 1, the Section Hospital; No. 2, upper floor, Station Hospital; No. 3, lower floor and B block, Station Hospital; No. 4, the Families' Hospital.

(7) An officer, Royal Army Medical Corps, will be appointed to

command each Section, with the position and powers of an officer commanding a company, &c., &c.

It is hoped that these arrangements will be mainly precautionary, for it is impressed on all ranks that prevention is better than cure, and that it is confidently expected that in the immediate future charge pay will be based, not on the number of beds in a hospital, but on the number of troops kept out of hospital beds, and that rewards will be given rather for successful prevention than for remarkable cures.

The organisation I adopt to meet these will be the subject of a further communication.

# United Services Medical Society.

## A PLEA FOR A MORE DETAILED STUDY OF THE SOLDIER'S HEART.

By Lieutenant-Colonel H. E. DEANE (R.).
*Royal Army Medical Corps.*

A plea for a more detailed study of the soldier's heart, in a wide, comprehensive sense, under conditions of work and play, mild and arduous, and not only under the conditions appertaining to the at present unexplained symptoms of what is called the "soldier's heart" in a more morbid sense.

This paper is no attempt at being didactic, but is intended to be suggestive of the need of prolonged observation of a very large number of healthy individuals, working and playing under the ordinary conditions of daily life. No members of the profession are so favourably situated for doing this as the Army Medical Service, with the whole of the British Forces at their disposal.

I must first fulfil the pleasant duty of offering my thanks to Colonel Rolt, Inspector of Gymnasia, and to the Army Gymnastic Staff, for the ready and courteous help they have always afforded me in making these observations at Aldershot, and to Sir Alfred Keogh for facilities granted me at Netley and Millbank.

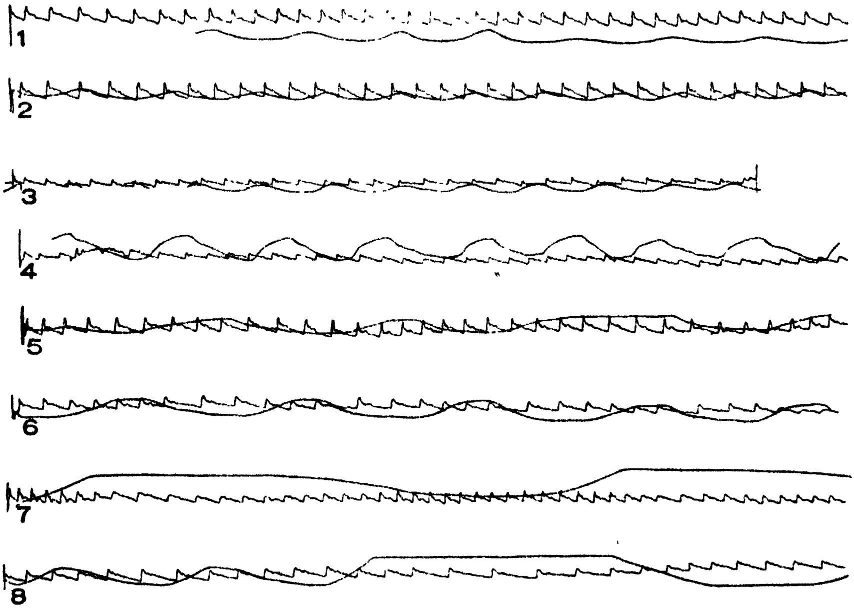
I have extended these observations beyond the Army, as I wished to ascertain the course of respiratory pulse curves in professional gymnasts, acrobats and dancers. The observations are the outcome of a paper published in the *Journal of the Royal Institute of Preventive Medicine* in May and June, 1906, dealing with the military position of "Attention," its absurdities and possible evils, and with the pulse-rate of recruits after gymnastic exercises. Further consideration impressed me with the necessity of knowing more of the subject of the pulse-rate of healthy individuals after exercises of various kinds and severity, before deciding that a recruit's pulse was necessarily unduly quickened. I think some facts which I observed, and which I am not prepared to explain, are worth bringing before the Services, with a view to further observations on a large scale being made. The information given in the books, that exercise quickens the pulse, was not very helpful. To begin at the starting point, there is a table laying down the average pulse-rate for different ages. Is that average based on pulse-rates when the subjects are lying, sitting, or standing, or on the average of all these positions? It is stated that tall men have, as a rule, slower rates than short men. I had the pulse of fifty men of the 2nd Life Guards counted during their ordinary duties one morning, and the average was exactly 75. In Schäfer's text-book of physiology, observations of Dr. Guy, of King's College Hospital, published in the "Cyclopædia of Anatomy," 1852, are quoted, stating that the pulse-rate of 100 men, averaging 27 years of age, was 78 standing, 70 sitting, and 66 lying. Dr. Guy also says that extreme results are very wide of the average, which they always are, by the way; for the difference between standing and sitting ranges from 0 to 24; between sitting and lying from 0 to 11; and between standing and lying from 0 to 28; and he only refers to healthy people. I have made observations on men and women after games, gymnastics on apparatus, free gymnastics, and after performing particular exercises: the variations are great, even in the same individual. For instance, in the case of a lady in her second year of training for a physical instructress under the Swedish system, on four different occasions the following pulse-rates were taken at the same hour, before and after the same kind of work, which lasted one hour: 104 increasing to 128 after the work; 120 decreasing to 112; 108 to 156; 92 to 124. And the work included deep breathing, which I understand had for its object a steadying of the pulse and circulation, whatever that may mean. I have been much struck by the little change in pulse-rate of the N.C.O.'s undergoing gymnastic instruction at Aldershot under the old system, of which I will give one instance. Forty-two men who had been twelve days under instruction were examined at 11 a.m., when they had already done gymnastics for an hour and a half; again at noon after another hour's gymnastics, and again at 2 p.m. after their dinners. The average at these times was respectively 89, 92 and 90; the range being respectively from 60 to 128, from 60 to 112, and from 60 to 104. Another squad of fourteen men, three days under instruction, had an average pulse-rate of 88 at 11 a.m., and of 110 at 3.30 p.m.—at the end of the day's work. I will give one instance of the result of short, sharp exercise: A senior member of the gymnastic staff had a pulse-rate of 68, and then engaged in a few minutes' bayonet work, at the end of which his pulse-rate was 152, falling in two to three minutes to 84. On one occasion I asked a recruit, who had been attending a gymnastic course for two months, to climb a rope without using his legs; he could only make an attempt at the exercise, and his pulse-rate rose from 84 to 128; I let him stand and walk about, and in about ten minutes the rate was 88. On the same occasion I asked another recruit to go over the bridge ladder, and his pulse-rate rose from 92 to 148, and in about five minutes was 104. Time will not permit of continuing this branch of the subject, and I will close it by saying that in counting the pulse of a number of men after exercise, the pulse of the men counted later will have had time to slow down; but the fact of their slowing down within such a short time is a healthy sign, and I think it advisable to count the pulse also with the man sitting in a case where it seems unduly fast when standing.

A prominent idea as to the causation of the irritable heart of soldiers has been and is, that it depends on interference with the free rhythmical performance of the respiratory act, and that such interference throws a strain on the right side of the heart. Now, how does it do so, what evidence is there of it, and how does it upset any or all of the functions of the heart, the rhythmicity, excitability, conductivity, contractility and tonicity; and can the disordered condition be rectified by amending the presumed faulty respiratory acts? These are questions awaiting solution.

In connection with interference with natural respiration reacting on the heart, I invite special attention to an article on the "Human Mechanism of Respiration," in the *Proceedings of the Anatomical Society* for May, 1903, and to an article on "Why does Phthisis attack the Apex of the Lung," both by Dr. Arthur Keith. He shows that expansion of the chest and expansion of the lungs are not synonymous terms. The expanding lungs not only open out the air spaces, but also the blood spaces, which, by drawing blood in, relieve the right heart. These blood spaces are not opened out unless the lungs are expanded in their more important diameter, the vertical, by means of the diaphragm; and unless they are opened out, the respiratory movement does not assist the heart, which has to pump against increased resistance. When a man keeps his chest expanded with sinking in of the epigastrium, the lungs are increased in a transverse diameter, and not at all or very little in a vertical diameter, and the venous spaces and capillaries are indifferently or not at all expanded; only the superficial parts of the lungs are expanded, the deep parts being unaffected. Further, if a man maintains a rigid posture, the burden on the heart is still greater, because the burden of the circulation is greater in a group of muscles in a state of tonus than when freely contracting and relaxing. I have been impressed with the necessity of being familiar with the action of the heart in healthy people, under various forms and degrees of exertion and under various phases of the respiratory act, before approaching the subject of the irritable heart of soldiers. First, I will give brief quotations on the subject from the books: " The frequency of the heart is increased by inspiration by a lessening of the vagal tone." "Inspiration causes, after a preliminary fall, a rise of blood pressure; and conversely, with expiration there is at first a slight rise of pressure, but the main effect is a fall." "Diastole of heart is favoured by inspiration." " Systole of heart is favoured by expiration." "The depth of a dicrotic notch (in a sphygmographic tracing) is increased by any cause which diminishes the volume of blood thrown out by the ventricle at each contraction, and also by any cause which, *cæteris paribus*, raises the pressure within the systemic arteries."

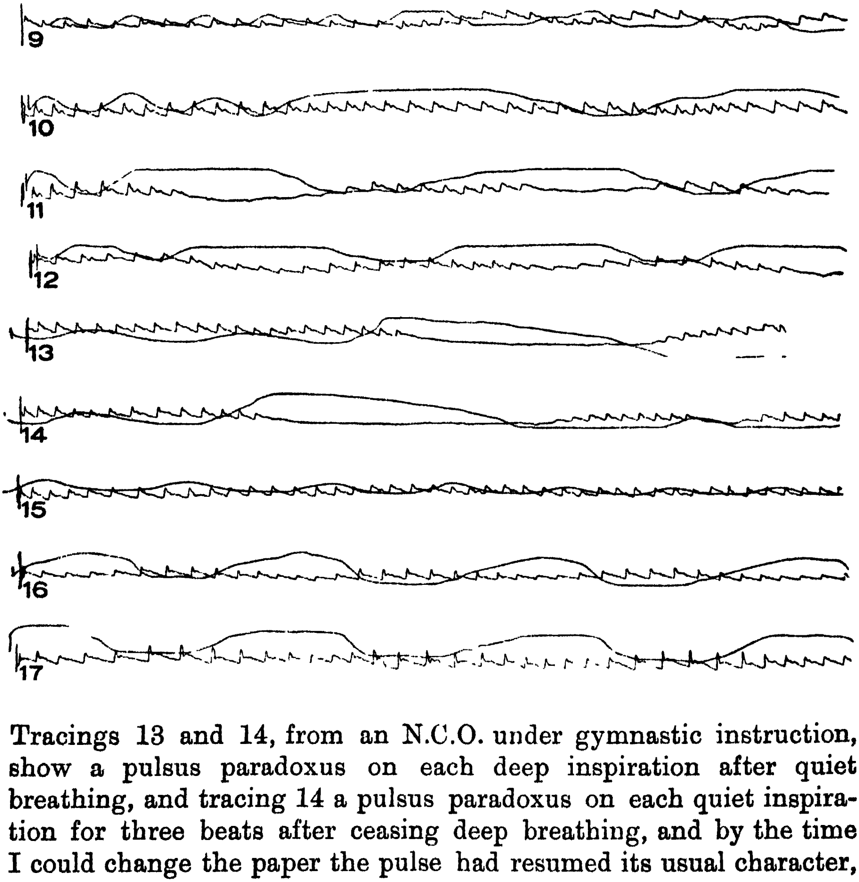
Respiratory changes in the pulse during quiet breathing may be scarcely noticeable, and I show respiratory pulse tracings of three excellent specimens of humanity, Georges Hackenschmidt, champion wrestler of the world, Tom Burrows, champion club swinger of the world, and Will Hill, the famous high wire walker, all of which show slight lengthening of the diastole during expiration, but not constantly so, and at times the expiratory diastole is shorter than the inspiratory. Tracing 4, of Bombardier W. A. Kenna, a famous swimmer and diver, holding the world's record for walking 90 yards under water in 2 mins. 44 sec., shows better than any of the others the inspiratory shortening and expiratory lengthening. I may mention he has remained under water for 3 mins. 54 secs.

I take next, the effect on the pulse of deep breathing, and the tracings shown, except when otherwise stated, were taken in an easy sitting posture, with the arms supported. The breaths were drawn easily without any straining, and the breath was not held. I can only give a few specimens illustrative of some of the manifestations noted, but all the originals are open to the inspection of anyone wishing to see them. Tracing 5 of Tom Burrows is typical of a constant manifestation—quickening of the pulse at the commencement of a deep inspiration, marked slowing towards the end, the succeeding expiratory beats being shorter than the terminal inspiratory ones, though longer than the early inspiratory ones; and in this instance the expiratory beats progressively shorten till the distinct quickening of the next inspiration. This lengthening of diastole at the end of inspiration is not dependent necessarily on the prolongation of the inspiration, as tracing 6 shows, in which the inspirations were drawn sharply and shortly. In some cases, as in tracing 7, though the duration of expiration is shorter than inspiration, the pulse is quicker during expiration. Tracing 8 is another example of slowing during inspiration, and in which the expiratory beats are equal in number, though the duration of expiration is considerably shorter than that of inspiration. A good example of the book statement that inspiration quickens and expiration slows the pulse is tracing 9. The effect of these alterations of pulse-rate during the separate phases of inspiration and expiration on the total pulse-rate is practically negligible, though I may say that the tendency is to slightly increase it, which is what one might expect. I have made so many of these observations that I am forced to the conclusion that the practice of interposing deep breaths, in so-called breathing exercises, into the gymnastic work of healthy men is useless for any purpose connected with the heart and lungs.

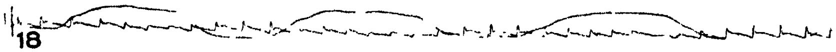


The next manifestation is one of the first that I noticed when

I commenced this work—the production of a pulsus paradoxus by deep breathing in healthy men. I show a series of tracings, 10 to 21, and I invite attention to some points connected with the condition. Tracings 10, 11, 12 are of a public school boy, aged 17. The first tracing shows ordinary quiet breathing and two long breaths, and no pulsus paradoxus. The next two tracings show a pulsus paradoxus on each inspiration, and an instant return of the pulse to its usual character on resuming quiet respiration.



Tracings 13 and 14, from an N.C.O. under gymnastic instruction, show a pulsus paradoxus on each deep inspiration after quiet breathing, and tracing 14 a pulsus paradoxus on each quiet inspiration for three beats after ceasing deep breathing, and by the time I could change the paper the pulse had resumed its usual character, as in tracing 15. You will notice in tracing 14 that the pulsus paradoxus persists into the succeeding expiration. This selection need not be extended at present, but will serve to introduce the first point on which information is required, namely, why is a pulsus paradoxus present at one time and not at another, with the man under apparently identical conditions, and moreover, present at one part of the day and not another, no matter how many deep breaths are drawn. Why is it sometimes brought out on drawing the first deep inspiration after quiet breathing, and sometimes not until several deep breaths have been drawn? Secondly, why does a pulsus paradoxus not occur on lying down? I say, why does it not occur? because I have not been able to get it, but on the contrary have found it present on sitting, disappearing, or markedly lessening on lying down, and returning on again sitting up. This seems to point to a mechanical origin of the phenomenon. Tracings 16 17, 18, 19 illustrate the point. They were taken from Lieutenant Simson, Highland Light Infantry, a Superintendent of Gymnasia, a man of good physique. Tracing 16 was taken sitting, 17 lying, 18 sitting. The difference between the tracings taken sitting and lying is very marked, and another curious point is that in the last of the series, tracing 19, taken sitting up, the pulsus paradoxus is not noticeable. I first noticed this inability to get the manifestation on lying down when trying to find out what was happening to the venous pulse during the stoppage of the radial pulse, and tracings 20 and 21 illustrate the point. The tracings were taken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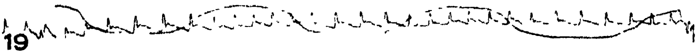
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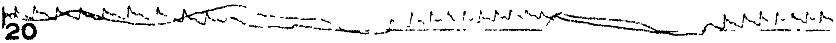
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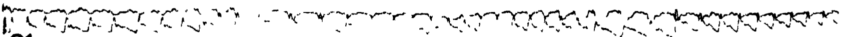
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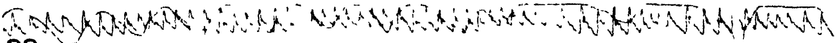
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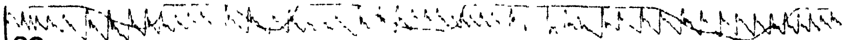
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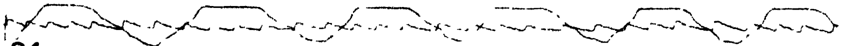
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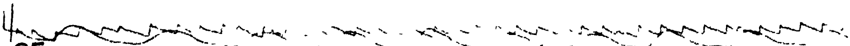
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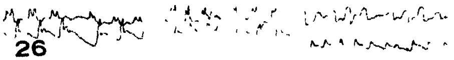
consecutively. By kind permission of Colonel Wardrop, Dr. James Mackenzie saw a man with me at Millbank Hospital, suffering from disordered action of the heart, and I drew his attention to the difference in the pulse on inspiration when sitting and lying, and he confirmed the observation by getting the man to sit up and lie down alternately.

The next manifestation I wish to invite your attention to, is the occurrence of extra systoles. In the first case in which I took tracings of these extra systoles, they occurred when drawing deep breaths after a period of quiet breathing. Tracings 22 and 23 show a case in point, and they also show the marked lengthening of diastole that occurs during inspiration. These were taken on June 19th, 1906; and on August 1st, 1906, I tried again, and found a remarkable absence of any change in his pulse on deep respiration (see tracing 24). This man was trained in the Aldershot School under the old regulations. The next example is of a man undergoing training under the new regulations, and here again we find an inconstancy about the occurrence of the extra systoles. On March 10th, 1908, I took tracings consecutively with 637 pulse-beats and there were 35 extra systoles, covering periods of quiet breathing, deep breathing, and after travelling along the bridge ladder, 13 occurring during inspiration and 22 during expiration. While holding his breath after an inspiration, during 38 beats of the pulse no extra systole occurred. I need only show one tracing (25) taken after travelling the bridge ladder, as an illustration. On another occasion I recorded 83 pulse-beats without the occurrence of any extra systole, and the man said he had been working harder than usual that morning. On another occasion, I recorded 165 pulse-beats without an extra systole, and then set the man to run about a quarter of a mile, and 8 extra systoles occurred in 250 pulse-beats. On another occasion I recorded 183 pulse-beats with no extra systole, and during part of the time he drew some deep breaths. He then climbed a rope with his hands only, and during 196 pulse-beats afterwards three extra systoles occurred, but only during the time he was drawing deep breaths. It is impossible at present to say anything as to the conditions under which extra systoles may occur in the way of exercise. The variations are great, and any conclusion jumped at from one set of observations will be upset by a further series of observations. This man appears to have less extra systoles the harder he works, and then, on the other hand, when he has no extra systoles, exertion like that of climbing a rope appears to bring them out. The man himself says that the more work he does the less conscious he is of a double beat of the heart. He formed one of the gymnastic class recently performing at the Tournament at Olympia, and one day I took a long continuous tracing without an extra systole. He has felt these extra systoles for some years—I may mention he holds a five-mile championship, won the N.C.O.'s Mile Championship in 1907, and was second in the open Half-mile Championship at the Army Athletic Meeting, 1907. I have not yet been able to get further observations as to the cessation or otherwise of extra systoles during held breath, when they occur during ordinary respiration.



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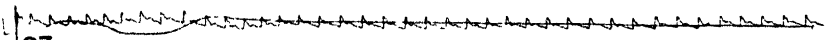

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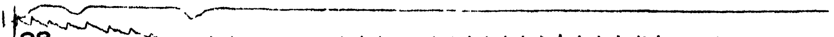

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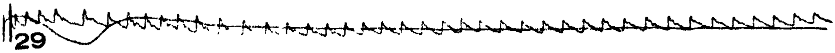

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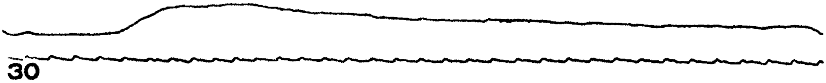

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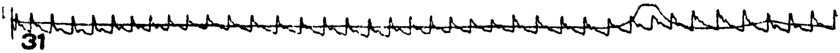

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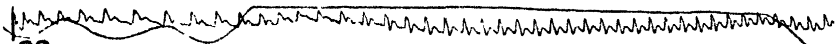

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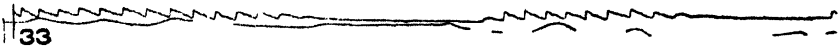

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Dr. James Mackenzie describes three forms of extra systole, and he suggests as a definition of the term "a premature contraction of auricle or ventricle in response to a stimulus from some other part of the heart than the remains of the sinus venosus at the mouths of the great veins, but where otherwise the fundamental or sinus rhythm of the heart is maintained." The three forms recognised are extra systoles due to premature contraction of the auricle, of the ventricle, and simultaneous premature contraction of the auricle and ventricle ; and they can only be differentiated from one another by a simultaneous record of the radial and jugular pulses, and even then difficulties present themselves.

Time will not permit of a detailed analysis of the jugular pulse, but I may say that the case under reference presents apparently two different conditions—extra systoles, and a complete pause of the heart—and I show tracing 26, from the same man as tracing 25, to illustrate the varieties.

The tracing is in three sections, the first of which shows an apparent pause. The simultaneous record of the jugular pulse shows that it was not a case of extra systole failing to show itself in the radial tracing. The second section of the tracing shows what I interpret as an extra systole starting in the auricle and transmitted to the ventricle, though the transmission is delayed beyond the period noticed in the ordinary cardiac contraction, as is demonstrated by the lengthened interval between A and C, representing respectively the auricular and ventricular contractions. The third section shows what I interpret as an auricular extra systole not transmitted to the ventricle; but I am open to correction as to this interpretation. Professor Cushny first demonstrated that the duration of the period including the long pause and the preceding beat, that is, the extra systolic beat, was less than the period of two cardiac cycles in cases of auricular extra systoles. Whereas in cases of ventricular extra systole the period corresponds to two cardiac cycles, as represented by two beats of the pulse. In the present case, the duration of the period of the long pause and preceding beat is markedly shorter than two cardiac cycles in both the second and third sections of the tracing, which points to the extra systoles being auricular in origin.

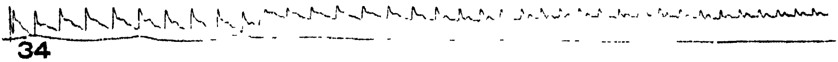
Now, as these extra systoles are not uncommon in young healthy adults, an important point at once arises applicable both to military and civil surgeons—What is the actual and prognostic significance of them? It is conceivable that a medical officer inspecting a class in a gymnasium might come across one, two, or more men with an irregularity of the pulse to the finger, as I have done; and he might think the man not only unfit to continue his gymnastic course, which would be bad, but worse still, he might think it necessary to send the man "sick." The case then only requires someone to think he hears a murmur and the man's career in the Service is in risk of being unnecessarily and unjustifiably blighted. In civil life it occurs that men are perfectly unnecessarily scared by someone discovering these extra systoles, and they get warned of this, and warned of that, see this specialist and that specialist, are sent to these baths and those baths, and make themselves miserable and poorer, and the extra systoles go on. Then someone else is consulted and he sends the man back to his work and play, with the advice to ignore his extra systoles and avoid the doctors, and the advice is justified; the man is once more happy and richer. Extra systoles in no way interfere with the man's capacities or capabilities, even for undergoing great exertion; they interfere with his comfort in no way, unless a consciousness of a double beat of the heart can be said to do so. Dr. Mackenzie tells me he has been watching men with extra systoles for the past twenty-five years and that they do not interfere with the men's health or efficiency.

Acting on the idea that interference with respiration was a factor in the production of irritable heart, I made observations to see what the effect of holding the breath and of straining was on the pulse, and I wish to say the straining which can be done with a sphygmograph on the wrist, and with no objective resistance against which to strain, is not at all analogous to the strain of a short or prolonged effort against resistance when every muscle of the body is at its maximum contraction. When a breath is drawn and held, there is at first a quickening, then a slowing, as in ordinary deep breathing, followed by another period of quickening, though not equal to the initial quickening; and this again is followed by another period of slowing, so that there seems to be a more or less rhythmical quickening and slowing of the pulse during a held breath. I have not been able to make out anything definite as to the number of pulse-beats occurring in each period. I show tracings 27, 28 and 29 to illustrate the condition; and in tracing 29, you will notice seven changes in the period of held breath.

Sometimes, after the initial quickening on inspiration and the usual slowing has occurred, the beats remain of the same length, but increase in length towards the end of the held breath, as in tracing 30. As regards the slowing of the pulse, the effect of holding the breath is temporary and the pulse resumes its usual rate immediately. The change occurs in men and women, and I mention that in case someone might say that the phenomenon was due to some special type of drawing the inspiration before holding the breath. For instance, tracing 27 is of Georges Hackenschmidt, tracing 28 of Bombardier Kenna, and tracing 29 of a ballet dancer.

Now what is happening to the heart during a held breath? I show a diagram taken by means of an ortho-radiographic machine by Dr. Bruce, Physician to the X-ray and Electrical Department of Charing Cross Hospital, of Bombardier Kenna's heart while holding a breath, and it shows a marked diminution of all the diameters of the heart. The greatest decrease was in the latitudinal and left median distances, representing respectively the right and left ventricles. The contracting process begins when the deep inspiration is drawn prior to holding the breath. I can find nothing in the effect of holding a breath to help in elucidating the cause of disordered action of the heart. When the breath is held after expiration a similar rhythmical condition obtains as in the case of inspiration, though not always so marked (see tracing 31).

My next point is the effect of straining on the pulse, and I wish to emphasise the remark that I made before, that the straining of such experiments is the poorest imitation of a real effort against resistance. The effect seems fairly constant, but one marked variation is enough to show that one explanation will not fit all cases. I show tracing 29 as a good example of what most frequently happens, the pulse becomes markedly dicrotic and slightly more rapid, and you will notice how the pulse rapidly resumes its usual character on the first inspiration after the straining ceases. Unfortunately, this could not be shown on the reproduction. Tracing 33 shows the exact converse, where dicrotism disappears during the straining and further a pulsus paradoxus is produced. As soon as quiet respiration is resumed the pulse resumes its usual character.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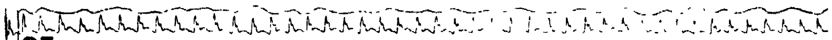
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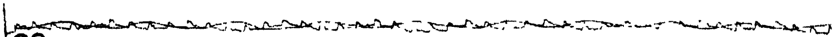
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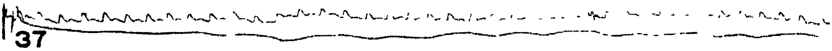
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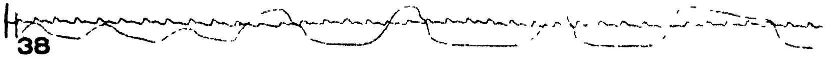
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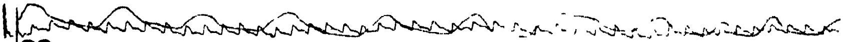
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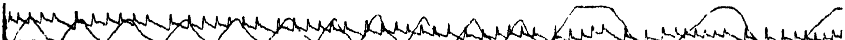
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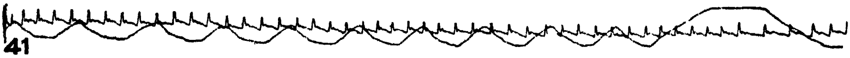
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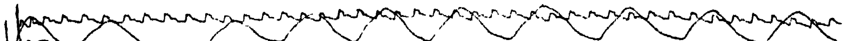
I got the man to draw a deep breath after one period of straining, and a pulsus paradoxus appeared. The same thing applies to the pulsus paradoxus here as to its production by deep breathing; it is not always produced, and may only appear after two or three strains. I give one more tracing (34) to show the effect of straining, and even here there is the same tendency to rhythmical shortening and lengthening of the diastoles; the tracing was taken from Georges Hackenschmidt.

Next, as to the condition of the pulse immediately after more or less violent exercise, with pulse and respiration considerably quickened. All the tracings given to illustrate this were taken immediately after cessation of the exercise. We are told that exercise raises the blood pressure, which, however, rapidly falls again. Immediately after exercise, one might expect the pulse to show signs of increased blood pressure, in whatever manner the pulse does that, and each one must decide for himself whether these tracings do indicate anything of the kind according to his own particular views of what constitutes a sign of increased blood pressure. First I show tracing 35 as a normal condition after severe exercise. It was taken from Lieutenant W. Halswelle, Highland Light Infantry, immediately after winning his heat for the Half-mile Championship at the Army Athletic Meeting, in August, 1906; and tracing 36 was taken after winning that championship the following day. Tracing 37 was taken from the Rev. Walker after winning the 100 yards in $10\frac{1}{5}$ seconds at the same meeting, and tracing 38 was taken half an hour later, and after doing some gymnastic exercises in addition at my request. It shows quiet breathing and deep breathing. Tracing 32 was taken from Lieutenant Kaulbach after winning the Obstacle Race at the same meeting. I show another tracing (40) taken after a run of 100 yards, illustrating a marked lengthening of a diastole occurring at expiration during natural respiration, but occurring at inspiration, when deep breaths are drawn. The next tracing (41) shows that as the breathing quieted down this phenomenon ceased during quiet respiration, and during deep breathing the pulse shows the usual lengthening of diastole towards the end of the inspiration. As a comparison, I show tracings 42 and 43 of the pulse of a hospital porter, an ex-soldier, and an untrained man, before and after running up to the top of the hospital and down.

I need not give more tracings to illustrate the occasional occurrence of extra systoles after exercise, or of the pulsus paradoxus when the breath is sufficiently recovered to enable deeper breaths to be drawn; suffice it to say that the same thing applies to its production as during deep breathing performed not after any particular exercise. For instance, I have a series of tracings taken from an officer in a gymnastic class at Aldershot, who ran about 160 yards for me, and no change occurred in his pulse so long as natural respiration was not interfered with; but after he had drawn a few deep breaths a pulsus paradoxus appeared, and he then breathed quietly, and his pulse resumed its usual characters; then again he drew some deep breaths without any trace of a pulsus paradoxus,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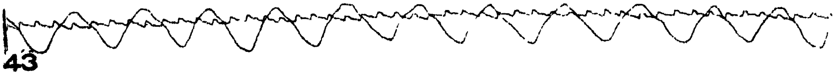
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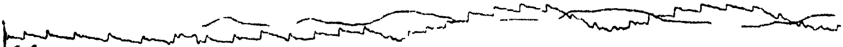
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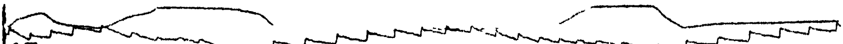
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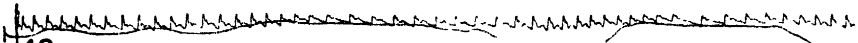
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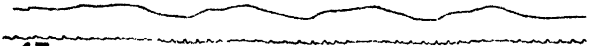
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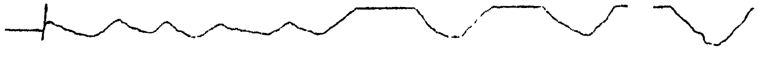
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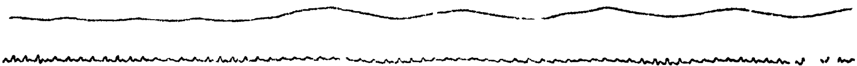
49

and on continuing the deep breaths it appeared once, otherwise the only change in the pulse during an inspiration was the very common one of diminished primary wave. This officer had been doing no gymnastics that day prior to my taking the tracings. I may make one remark here with reference to the idea of deep breathing slowing or steadying the circulation after active exercise. In the same length of tracing taken immediately after the run, and taken after a period of quiet and deep breathing, the pulse-beats were respectively 69 and 56, the difference between which is only that not uncommonly observed between a standing and sitting posture independent of any active exercise. The fact becomes strongly impressed on one, that should it be thought necessary to adopt means to slow the action of the heart, the simplest, best and immediate way is to sit or lie down.

Anyone who has taken a large number of sphygmographic tracings will be familiar with the fact that the level of the tracings has a tendency to vary according to inspiration and expiration—the abscissa line, as it is called, rising and falling. In Schäfer's text-book of physiology it is stated that during a deep inspiration the line of tracing falls owing to the emptying of the radial venæ comites, and that during expiration the line of tracing rises, owing to the filling of the veins causing an elevation of the pad of the sphygmograph.

Now the line of tracing does not always fall on inspiration, either in men or women, and as another point is also illustrated in the tracings I am showing next, I will mention it now, that is, that a deep inspiration causes increased dicrotism of the pulse, which I take to mean during the actual inspiratory phase. And further, you remember the books tell us that any cause which diminishes the volume of blood thrown out from the left ventricle increases the dicrotism. Therefore, as expiration favours the escape of blood from the left ventricle one would not expect to find a dicrotic pulse during expiration.

This increased dicrotism in inspiration is by no means always the case, and I suspect the statements have been based on experiments many in amount perhaps, but on a very limited number of individuals, and explanations devised to fit those observations may not serve to fit different phenomena brought out by extending many observations over a large number of individuals. Before going further, I may say that some authorities doubt the significance of the rise and fall of the line of tracing, and I can say myself that the degree of rise and fall varies with the instrument used. You may get a marked rise and fall, for instance, with a Dudgeon's sphygmograph, and a much less marked one or none at all with Mackenzie's ink writing instrument. A good example of the falling abscissa line and of dicrotism on inspiration is tracing 44. I give this tracing to invite attention especially to the point, which requires solution, as to what significance should be attached to this rise and fall. Conclusions are drawn as to the alteration in blood pressure during inspiration and expiration from this rise and fall, but as we know, physiological conclusions change with the moon. I wish to mention one observation that I have made about this tracing and others of the same kind, it is this; the next consecutive tracing I took under identical conditions failed to show this rise and fall of the abscissa line, and I am not prepared with an explanation. The subject is worth further study in view of unwarrantable conclusions being drawn. Tracing 45 shows the same fall, but the absolute opposite of what is called dicrotism, during a deep inspiration. Tracing 46 shows that the dicrotism occurs during expiration. This tracing was taken from a N.C.O., under gymnastic training, and I show tracing 47 of a woman, for comparison, to show the marked dicrotism during expiration, and also you will see the line of tracing rises instead of falls during inspiration and *vice versâ*. Now, while this tracing is before you I wish to make a short digression. A short time ago I showed a series of tracings, of which this formed one, to a man who had written a good deal on the subject of sphygmographic tracings, and he said, "There is a good instance of abdominal breathing," which came as a revelation to me, because the subject of this tracing was a ballet dancer, and the tracing was taken with her corsets on, and I was under the impression she was an excellent example of the so-called costal type of breathing. I made a further series of observations on the same lady with her corsets fastened as before, with the corsets unfastened and breathing only with the abdomen, and breathing with the ribs and abdomen drawn in: the results in each case were identical. See tracings 48 and 49, in the former of which abdominal breathing only took place, with the corsets undone, and in the latter of which costal breathing only took place, the abdomen being drawn in, and the respiratory bag placed over the front of the chest on the left side. I used Mackenzie's ink writing polygraph in this instance, but the dicrotism on expiration is sufficiently well marked for demonstration, and also the rise of the line of tracing during inspiration and fall during expiration, though neither phenomenon is so marked as with Dudgeon's instrument.

I pass now to a point which requires investigation and explanation, and that is, the changes that occur in the jugular pulse tracing, not only during deep respiration but often observable during quiet respiration. It may be that the changes in the tracings are partly due simply to mechanical causes referable to sucking in of the tissues of the neck, but as I am not prepared to explain the changes, and am not aware of anyone having even attempted an explanation yet, it is useless to pursue the subject at present. During a held breath there is a remarkable absence of any change in the record of the jugular pulse as compared with that of quiet respiration, so one cannot say there is any evidence of venous congestion; and this leads to reference to another point, which is the circle of dilated venules following the outline of the costal arch, and which I have generally heard referred to as an evidence of emphysema. I have had that explanation given me by a leading consultant in London, and the explanation will not bear the slightest examination. Whatever the explanation may be, there are no grounds whatever for ascribing the phenomenon to emphysema, unless some other definition of that term be applied than that usually obtaining. I confess I accepted the explanation at one time, till I began to observe more closely for myself. Emphysema is defined as a disease of the lungs characterised by over-distension of the alveoli and atrophy of the alveolar walls, and the emphysematous lung becomes inelastic and non-collapsible, and the portions of the lung most liable to emphysema are the anterior borders. Now consider the circumstances under which this circle of venules is observed. Patients suffering from emphysema do not exhibit it; young men exhibit it, who do not work any harder physically or as hard as other men who do not exhibit it, nor do the former experience any more shortness of breath on exertion than those who do not exhibit it, and further some men who undergo great exertion with no breathlessness exhibit it, and if you percuss the hearts of such men during a deep inspiration and expiration you can follow the uncovering of the heart by the lung as expiration begins and continues, and *vice versâ,* you can follow the covering of the heart during inspiration, clearly showing that the lung is expanding and collapsing freely. I have not been able to take a satisfactory tracing of the jugular vein during a period of straining, as it has been impossible to obviate interference with the tambour by muscular action.

Now I will briefly refer to cases of disordered action of the heart. The first desideratum, indeed necessity, seems to me to make a sharp distinction between cases displaying simply disordered action without objective signs of valvular lesions, and cases of valvular lesions, further it seems necessary to apportion a due value to cardiac bruits which may be unattended with other objective or any subjective signs; and again, cases occur where a bruit exists with signs of disordered action and subjective symptoms, which completely recover. Of course, I know the difficult question arises as to whether a man who has once broken down, even temporarily, in that way, can in the interests of the Service and of himself be profitably retained in the Service. I wish to invite your attention to one or two points which may eventually lead to something being determined as to the causation of cases of disordered action of the heart by a more detailed study of the conditions under which the men have broken down and a more detailed study of the cardiac condition. I may mention here that it is far from uncommon, as every military surgeon here will know, for men to be ordered sick from an inspection, maybe for a gymnastic course or foreign service, and also cases occur where men have reported sick for some slight ailment, and while in hospital a bruit has been discovered. Though such cases are brought before an invaliding board they are often returned to duty from Netley. Now for an instance as to the circumstances under which some men develop symptoms necessitating them reporting sick. A man, aged 25, with over six years' service, reported sick after running drill because he could not get his breath, and before this he could run about 5 miles. The breakdown occurred at Poona, where, in the month of June, the men were sent out to run perhaps 2 or 3 miles before breakfast. On the other hand, we get a history like the following: A man, aged 22, with four years' service, felt nothing wrong during his first two years' service at home, but after being in India a few months began to suffer from shortness of breath on any exertion and from palpitation. Again, a man, aged 25, with ten years' service, was sent sick from a medical inspection. He had been a cornet player for nine years and gave it up on account of shortness of breath, and he had experienced shortness of breath on exertion for six years prior to being sent sick.

I refer now to a case I was able to see with Dr. Mackenzie at this hospital, a man, aged 22, with two years' service. Five months previous to my seeing him in March of this year he had been in hospital for impetigo, and was being discharged well, when, on carrying his kit from the pack store, he suddenly felt queer, faint, and giddy, and was conscious of his heart beating, and was readmitted. I saw him on March 17 and made the following observations: The apex of the heart was in the normal situation and not the slightest sign of any enlargement could be made out, nor could Dr. Mackenzie, on a later occasion, find any evidence of dilatation. There were tender points in the two or three upper left intercostal spaces. When lying down his pulse-rate was 88, sitting 92, standing 152, and after walking up and down the ward once, 172. Immediately on lying down it fell to 92, again on sitting rose to 124, and on standing to 148. After a short interval the pulse-rate on lying was 80, sitting 84, and standing 124. I made further notes about a week later, and his pulse-rate when lying was 84, sitting 88, standing 164, and on sitting down immediately after that count it fell to 96, and on standing up again rose to 126. I then got him, while standing, to draw a few deep breaths, not forced ones, and after them his pulse-rate was 152. The deep breaths had no slowing effect at all; quite the contrary apparently. He then walked up the ward once, and his pulse was 164, falling immediately on lying down to 84. After an interval, his pulse, on standing, was 120, and I then got him to draw a deep breath and hold it as long as he comfortably could, and after resuming breathing the rate was 112; after a short interval I repeated the observation and the rate fell to 100, and on a third repetition of the observation it was still 100. Fortunately I am confining myself rigidly to observation of facts to the best of my ability, and scrupulously avoiding drawing any conclusions or deductions; otherwise one might jump to the conclusion that holding the breath would always slow down the rapid pulses of these cases. Perhaps it will. I do not know yet, but I do know they will slow down without it, because on a still later date his pulse-rate, when standing, was from 96 to 108, and after walking up the ward rose only to 124. In dealing with the whole subject of this paper one meets with so many variations and apparent contradictions that one might almost undertake to produce off-hand half a dozen facts to contradict any explanation that might be devised. Dr. Mackenzie and I took sphygmographic tracings of the apex beat, radial and jugular pulses, and he could detect nothing to throw any light on the condition. The excursion of the jugular pulse was large, but so it may be in other cases. One frequently observes in these cases, which, however, was not so in this man, a general nervous condition and a great susceptibility to influences which had no effect whatever on the man prior to the cardiac condition supervening.

I submit, gentlemen, that the subject requires to be investigated *de novo*, shorn of all mere ideas, theories or suppositions, whether such have reference to cigarette smoking or anything else; detailed investigation is required as to the circumstances under which the men break down, and also a detailed graphic record of the cardiac conditions. I would ask, is it quite certain that the equipment has nothing to do with the subject? And one line of investigation I suggest, and which I cannot now pursue myself, is a detailed examination of men after marching or after a field day. As regards graphic pulse records, it requires very little practice, and Mackenzie's polygraph attachment to a Dudgeon's sphygmograph has the merit of being simple and cheap. His ink writing machine enables many feet of continuous tracing to be taken.

One word with reference to the idea that fixation of the chest and venous congestion are concerned in the causation of this disordered action of the heart. Now no effort of any kind, not even the simple action of carrying a chair across a room, can be performed without some fixation of the chest, and many occupations involve more fixation of the chest during efforts than is the case with the soldier. Why need fixation of the chest during an effort, which is perfectly natural, produce venous congestion sufficient to produce this cardiac condition, and, moreover, has Nature done her work so badly that not only may the ribs be fixed but also the diaphragm during an effort, and no provision be made for the temporary natural alteration in the respiratory and circulatory spheres? We know Nature does better than that though we may not know how. To say that a man is to do nothing that necessitates fixing his ribs and even his diaphragm seems nothing short of an absurdity. Constant or frequent interferences with the natural means adopted by Nature for equalizing the respiration and circulation is another thing, such as keeping men fixed in the unnatural position of "attention" or letting them march in clothing or equipment that interferes with the action of the diaphragm. As I said at the beginning I repeat at the end, this paper is simply suggestive for further and more detailed investigation of the whole subject. The field is an open one, badly calling for clearance of wild, unsubstantiated statements, contradictory theories, and explanations made to fit one observation and completely failing to fit other similar ones.

To summarise briefly: The factor or factors concerned in the production of the irritable heart of soldiers are not at all clear, though perhaps the subject can be made to appear clear on paper. The subject requires more detailed clinical study, and, moreover, prolonged investigation of large numbers of healthy men under natural conditions of work and play is required to find out normal variations, the effect of exercise, and the effect of respiration on the circulatory system, and then something definite and useful may be learnt as to the effect of respiration in cases of disease.

In view of the contradictory statements made regarding the value of artificial deep breathing and of the types of breathing, it is clear to me that the subject requires to be studied afresh from the practical and clinical sides amongst men following their ordinary daily avocations, whether that of soldier, sailor, tinker, or tailor. No body of the profession has access to sufficient material on which to study the many variations that may occur except the

Services, and this may partly account for the constant amendments, corrections, and contradictions that are met with in the literature of the subject. In carrying on the investigations one point must stand out in a lurid light, that is, rigid avoidance of being in a hurry to explain phenomena and jumping at conclusions which will only have to be altered at the next new moon, if not before.

## DISCUSSION.

Inspector-General Sir **Herbert Ellis** thanked Lieutenant-Colonel Deane for his paper, and said he was sure they were all very pleased to have heard such a very interesting paper, and he had no doubt that they would like to hear a few remarks from Dr. Mackenzie, who took such an interest in this work.

Dr. **Mackenzie** stated that it had given him much pleasure to listen to such a very interesting paper. He commenced to work twenty-five years ago, and gave several instances of individuals who came to see him, suffering somewhat slightly, who were either rejected by life insurance companies, or had to pay very increased premiums if they were entertained. He pointed out that there was no subject in the history so clearly recognised, and it was in regard to this that such work as Colonel Deane's was of the greatest importance.

Sir **Herbert Ellis** enquired if anyone had any further remarks to make before the meeting closed. He stated that he had served on two occasions with the Marine Artillery, when he saw a larger number of men suffering with heart trouble than he did with the blue jackets during the rest of his service. He pointed out that some two years ago he was very much struck with the depôt at Walmer where the present system of physical training introduced such hard work on the parade ground. He saw nine or ten young men brought down, and not fit to do the hard work on the parade ground. He was sure it was their wish that he should be the means of conveying to Colonel Deane their thanks for the very excellent paper read.

Colonel **Leishman** stated he had very little to say except that he had obtained certain experiences of heart trouble from the number of *post mortems* held, and he had got the general impression from soldiers who had died that a certain amount of heart disease was not uncommon. He stated that he had not any definite figures to show.

Colonel **Deane** then replied to one or two questions which were put by Colonel Leishman, and gave the price of one or two instruments, and this closed the meeting.

Sir **Herbert Ellis** informed them that the next meeting was an extra one, to be held on July 1st, and that Lieutenant-Colonel Macpherson would read a paper on prevention of disease in Panama and Cuba.

# Clinical and other Notes.

## A NOTE ON THE "TRAITEMENT A VIDE" OF ENTERIC FEVER.

By Major H. P. JOHNSON.
*Royal Army Medical Corps.*
With Remarks by William Ewart, M.D., F.R.C.P.

In the summer of 1905, when acting as Medical Registrar of St. George's Hospital, I had the opportunity of observing the second case of enteric fever treated by Dr. Ewart *à vide*, and described by him in his well-known clinical lecture on the principles of treatment of typhoid fever. I was so struck by the extraordinary success of the treatment *quâ* absence of fæces in the stools, and by the general well-being of the patient, that I determined to give his method a full trial at the first opportunity. Since that date I have had few cases of enteric fever to attend, but I record a brief *résumé* of eight cases treated in accordance with Dr. Ewart's method.

(1) Constable B. A moderately severe case complicated by a relapse on the thirty-fourth day of disease, with final fall to normal on the forty-eighth day.

(2) Private B. An extremely severe case of the adynamic type. Perforation on the twenty-fourth day of disease, with a second perforation on the twenty-eighth day. Operation was not possible as the man was far too exhausted. *Post mortem*, the first perforation was found to be closed by adhesions to the surrounding gut.

(3) Lieutenant C. A very severe case, with delirium, hyperpyrexia, floccitation, and a large hæmorrhage on the twenty-third day. Normal temperature maintained from the thirty-sixth day.

(4) Private A. An ordinary case, with no complications. Normal temperature reached on the twenty-eighth day.

(5) Private C. A very mild case without complications. Normal temperature maintained from the twentieth day.

(6) Constable K. A fairly severe case, with relapse on thirty-second day. Still in hospital.

(7) Private F. A mild case, with severe relapse on the twenty-sixth day. Still in hospital.

(8) Private B. A mild case not treated by me; followed by a relapse on the fiftieth day, lasting eighteen days under treatment *à vide*.

All these cases were fed entirely on whey, 3 pints, albumin water 1 pint, sugar 2 ounces, butter (it being impossible to get cream) 1 ounce, daily. The two men still in hospital are also being given two teaspoonfuls daily of sanatogen (a combination of casein and glycerophosphate of sodium). Medicinally the treatment was by cold sponging and the ice pack whenever the temperature reached 103° F., with small doses of strychnine and solution adrenalin chloride, 5 to 20 minims, when there were any signs of impending heart failure. In none of the cases was there any diarrhœa, and the bowels were kept acting regularly by small doses of castor oil in the early stages of the disease, and by glycerine enemata later.

The results of the treatment in my hands, therefore, have been little short of disastrous. Out of a total of eight cases I have had one death and three relapses, and in only three instances has the disease run a mild course. I cannot help thinking that possibly the relapses have been due to a starvation and under-stimulation of the intestinal tissues, owing to the absence in the dietary of any form of food which is capable of leaving a semi-solid residue after digestion; and for the future I shall aim in my line of treatment at obtaining the fullest possible rest for the bowel by means of unirritating and easily digestible foods which will, however, leave a small pultaceous residue to act as a stimulus to the intestines and enable them to retain their natural tone.

### REMARKS BY WILLIAM EWART, M.D., F.R.C.P.

I. *As to the cases*, the remarks which Major Johnson desires me to add cannot claim much critical value in the absence of full temperature charts and notes; the dates of invasion and the particulars of treatment and of its changes and duration being essential in enteric where an early intervention is of paramount importance. Moreover, it does not appear that my method was carried out, except in the matter of the diet, and of the administration of *castor oil* daily, and that only for a time. I myself continue it right through to convalescence.

This short series of eight cases was a specially unfortunate one. There were: (1) *Two very severe cases* (Cases 2 and 3), *a proportion of* 25 per cent. instead of the usual 10 to 15 per cent. Unless these had been treated quite early, recovery was not to be expected; yet one of them recovered. (2) Mild cases such as 4 and 5 need no comment. (3) Two cases of some gravity (1 and 6) had relapses of moderate severity beginning on the thirty-fourth and on the thirty-second day. And (4) two mild cases (7 and 8) had rather severe relapses beginning on the twenty-sixth and on the fiftieth day respectively. Was this high percentage (50 per cent.) of relapses produced by the diet? I cannot regard this as probable. More probably these were cases of wide and deep-seated infection and special susceptibility, which might have done much worse than they did. *Concerning these relapses*, we should not forget that the alternative might have been a continued and perhaps fatal ingravescence. If we are to view a relapse as the direct result of treatment in the sense of a price to be paid for the advantage of an early defervescence, we should surely regard the interval of improvement as a definite gain in itself. But, in any case, we are not surprised to find that, as in relapsing pneumonia, the severity of the second attack is mitigated by the immunizing effect of the first attack, and is generally survived.

*The general conclusion would seem to be that the cases* do not carry much weight of evidence against the treatment by whey. In this connection it might be mentioned that the *Medical Record* for June 20th, 1908, contains three papers, by A. Seibert, Cyrus J. Strong, and Robert C. Kemp, all reporting favourably on a "milk-free fluid diet" coupled with rectal irrigations of water.

II. *As to the principles and details of treatment.* So long as a sero-therapeutical cure is not available, I still hold that in addition to *feeding to the utmost* with absorbable fluid foods the following *indications* are the best:—

(*a*) To empty the bowel and keep it empty by complete daily *cleansing from above.* This cannot conceivably multiply, but must tend to eliminate the agents of infection. Castor oil is the best means to this end (1, 2, or 3 drachms every morning). Rectal enemata and irrigations may do good, but do not carry out this essential provision.

(*b*) To remove *toxins* from the bowel. The mucous membrane becomes more absorbent for them as well as for food the cleaner and emptier it is. This is why *charcoal,* which absorbs them (and preferably perhaps animal charcoal as more absorbent than vegetable charcoal, or equal parts of animal and vegetable charcoal) is an essential in the treatment which I have described.[1] Owing to the removal of the toxins it has the effect, originally pointed out by Bouchard, of allaying the delirium and the nervous prostration which led the Germans to use for typhoid fever the popular name "Nervenfieber." Charcoal, although quite inert against microbes, absorbs other alkaloids such as strychnine, &c. It should therefore be kept abundantly present in the entire bowel, where it not only cleans, but gently stimulates the ulcers and forms in addition, mixed with mucus, an appreciable material for peristalsis. One or two drachms in water every four or every six hours should be administered; but if possible at an interval from those foods which are selected for the sake of their stimulating aromatic property.

(*c*) To destroy the bacillus by the surface action of harmless antiseptics. This becomes a practical object of treatment as soon as the complication of fæces has been to a very large extent eliminated. The latest remedy which has been suggested is Frenkel's magnesium peroxide keratin-coated capsules, which have lately been used by W. Kirkpatrick, of Stourbridge[2]; but the hydrogen peroxide they liberate might be absorbed by the charcoal.

(*d*) To protect and lubricate the mucous surface and that of the ulcers. For this purpose liquid paraffin (1 or 2 drachms every four or six hours) is probably very useful. It is not, however, so essential a part of the toilet of the bowel as the charcoal.

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[1] *British Medical Journal*, vol. ii., 1905, p. 1507.

[2] *Cf. Lancet*, vol. ii., p. 1512, May 23, 1908.

(*c*) *Lastly, abundant residueless food, and tonic nourishing drugs,* including strychnine, digitalis, and the calcium and phosphorus groups of remedies, would stand their best chance of absorption and of assimilation where the bowel was being *thoroughly attended to* in this way. This nutritional advantage is our best, nay, hitherto our only way, of fighting indirectly the intensity of the infection, having its stress in the blood even more than in the bowel. Thus to neglect it systematically because in the absolutely hopeless case it is, of course, unequal to impossibilities, would be to the detriment of all other enteric patients. And to delay it even for a day is to render it less likely to yield its best results.

The bad cases may need *stimulation* by alcohol occasionally, or by French wine. Above all stout may be administered steadily for the sake of its nutritive value. But even without this additional help it is possible in the majority of cases to arrive at results which are practical proof of "good treatment." For when defervescence does come, the patient feels in high condition, and the temperature is barely subnormal and free from the usual falls to 96° F. or lower.

(III.) As regards Major Johnson's important suggestion that the intestinal tissues may suffer in their nutrition and tone, I can offer no further comment than the statement that peristalsis is provided for by the daily administration of castor oil, and by the presence within the bowel of charcoal, mixed with mucus and other secretions and sheddings from the mucous membrane. On the other hand, if the dieting can be fully carried out there should be no starvation of any of the tissues of the body, though the intestinal wall, when kept more at rest as in the *empty bowel treatment*, may need and may assimilate rather less nutriment from the blood.

## LIQUOR HYDRARGYRI PERCHLORIDI (B.P.) IN THE TREATMENT OF DIARRHŒA ON FIELD SERVICE.

By Major N. FAICHNIE.
*Royal Army Medical Corps.*

One of the most universal diseases on Service is undoubtedly diarrhœa, and any drug that will cure this complaint quickly is worth bringing to notice, as, apart from the discomfort, the fact that the bowels are opened several times a day at inconvenient times and places, and possibly during the night-time, instead of once a day at a selected time, with sanitary conveniences available, must be of great weight from a sanitary point of view.

Many years ago, on first going to India I was recommended to use liquor hydrargyri perchloridi for an intractable case of diarrhœa, and I found it most useful. During the South African War, when diarrhœa was a very common complaint, I found it an exceedingly valuable medicine; it was so often successful where other drugs failed, that there can be no doubt of its therapeutic value. Liquor hydrargyri perchloridi is described as an intestinal disinfectant, and combined with chlorodyne seems to remove the cause as well as the symptoms of diarrhœa. Its use is well known and my reason for bringing it forward now is, that when in charge of two sections of a British Field Hospital during the late Mohmand Expedition I was unable to administer it for a time, when diarrhœa was prevalent, as it is not provided in the panniers. As a substitute, however, I used the following, which acted equally well, viz., one soloid of the perchloride of mercury supplied as an antiseptic, containing 8·75 grains of hydrarg. perchloride, dissolved in 17½ ounces of water, which gave a mixture containing $\frac{1}{16}$ grain in one fluid drachm, the same strength as the B.P. preparation. The blue colour of the soloid, due to an aniline dye, is quite harmless.

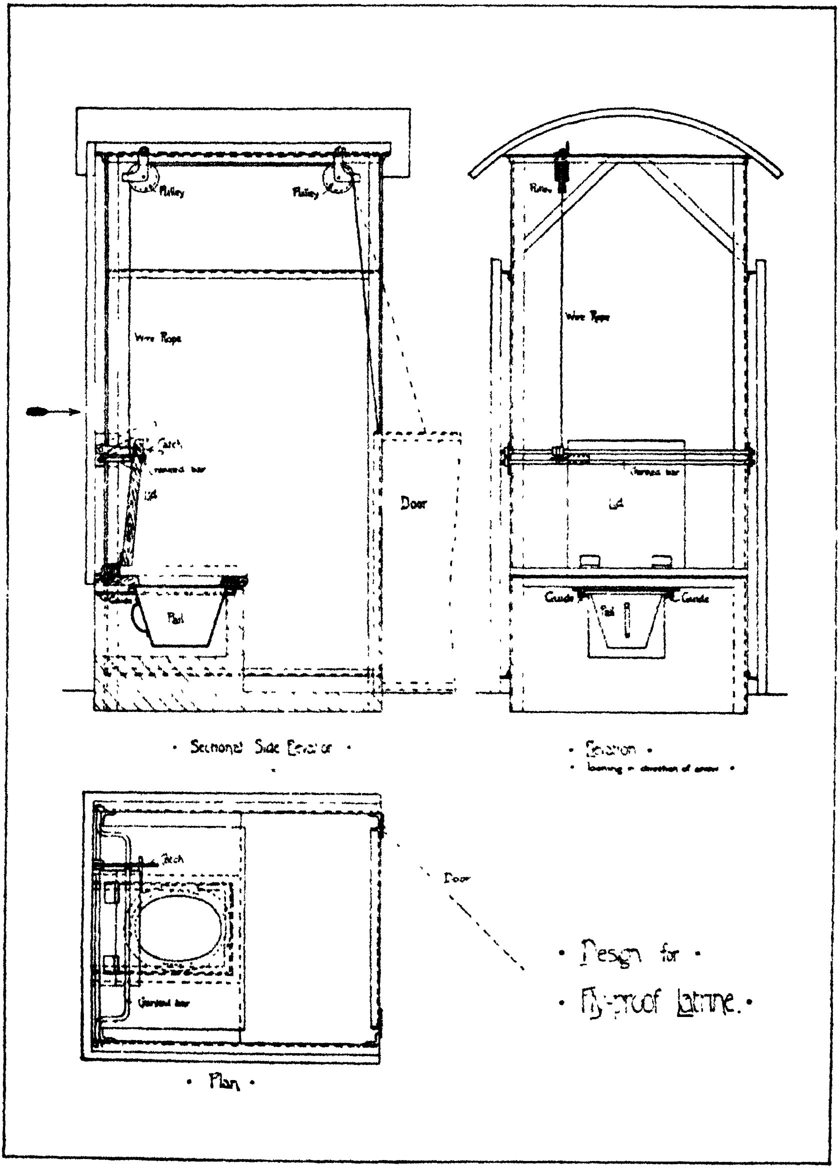
## AN AUTOMATICALLY FLY-PROOF LATRINE SEAT.

By Captain L. W. HARRISON.

*Royal Army Medical Corps.*

That the pattern of latrine in common use in Indian barracks could easily be improved on no one will deny. Unprovided as it is with a lid, and having a large space under the seat in which the ghumlah is very often placed with its large edge under the centre of the hole in the seat, nothing appears better calculated to encourage the conveyance of infection from latrines to food. Attempts have been made to render some latrines fly-proof by placing a fly-proof door over the opening in the back of the latrine at which the ghumlahs are inserted, and by fitting a lid which is supposed not to be capable of being pushed back so far that it cannot drop automatically. The disadvantages of the latter pattern appear to be that the fly-proof door is liable to damage and rust, and to become no longer fly-proof, that it is inconvenient for placing the ghumlah in position, and that the lid has to rest on the back of the person using the latrine. The latter, I submit, is a serious objection, not only because of its annoyance to the man, but also because very frequently in getting up, a man soils the front of the seat with a trickle of the urine and the lid falling on this, in turn becomes contaminated.

In 1906 I showed to the Enteric Fever Committee in Simla a model of a latrine which seemed to overcome many of these objections, and in 1907, by the kindness of Lieutenant-Colonel W. A. Morris, R.A.M.C., I was allowed to fit the arrangement to a latrine at the Station Hospital, Murree. Though it was put up very crudely by a local mistry, it worked exceedingly well, and I was encouraged to build a large model which could be photographed.



· Design for ·
· Fly-proof Latrine. ·

The accompanying drawings illustrate the idea in an improved form. At the back of the latrine compartment a horizontal bar is placed at a height above the seat 3 inches less than the distance of the front edge of the lid from the hinges. This bar is bent at each end at right angles, and again at right angles so as to form a crank the ends of which engage in bearings formed by small plates fixed in the sides of the compartment. The iron bar is arranged so that its main part lies in a plane a little in front of the hinges of the lid. The result is that when the lid is put up it is prevented from being thrown back further than to an angle which is rather less than a right angle with the seat by its top catching against the bar. With no further addition the lid would fall automatically unless supported by the operator. To avoid this disadvantage, a catch, like the catch of a door, is hinged on the back of the latrine just to one side of the lid and on a level with the crank bar when the latter is in the horizontal position. The catch rests freely on the bar. From the side of the lid and at the same distance from the hinges that the crank bar is above the latter, a small iron peg projects which, on the lid being thrown up, engages the sloping edge of the catch, lifting it and being caught by it when the sloping edge is passed. Attached to the bar at a convenient position is a rope of flexible material which passes to the top of the compartment, over a pulley at the back, over another at the front, and down to be attached to the top of a door, 3 feet high, at the entrance to the compartment. This door could conveniently be fitted with a spring to make it self-closing. When the man opens the door to leave the compartment the rope is pulled and lifts the crank bar. This in turn lifts the catch which rests freely on it, and so releases the lid, which falls automatically. To prevent the crank being thrown up too far by the door being violently thrown open, a small piece of iron is fixed to the side of the compartment so as to project at a convenient distance above one of the arms of the crank.

The ghumlah is provided with a lip which rests on guides fixed on the under surface of the seat and is prevented from being pushed too far forward by a stop in front. The distance between the bottom of the ghumlah and the floor of the space under the seat should be such that the ghumlah cannot be placed with its edge under the guides on which it should rest. If this distance be made too great one can be quite certain that the sweeper, according to his nature, will replace the receptacle wrongly.

The result of this arrangement is that the ghumlah can only be placed in one position under the seat, viz., so closely up under the seat that no fly will creep in, and also never to one side or the other as happens so frequently with the pattern in use at present.

# Reports.

## ON A MARCH MADE BY D COMPANY, FIRST WEST INDIA REGIMENT, THROUGH THE SIERRA LEONE PROTECTORATE, TO DETERMINE THE MOST SUITABLE SCALE OF RATIONS FOR THE WEST INDIA SOLDIER ON ACTIVE SERVICE.

By Lieutenant T. W. BULLOCK.
*West India Regiment.*

The march commenced on December 23rd, 1907, and was to be of twenty-eight days' duration, but in order to economise as regards carriers, the last two marches were performed in one day. The experiment lost nothing in value by this early return to barracks, for the men were able to buy civilised food on the last day of the march, and therefore any deductions drawn from observations made on that particular day would have been valueless. The route was selected under the orders of the General Officer Commanding Sierra Leone, and was about 290 miles in all. This was covered in nineteen marches, averaging fifteen miles each, the longest being from Younibanna to Ronietta, twenty-one miles, and from Songo Town to barracks, twenty-seven miles.

*Personnel.*—The strength of the company was: Two officers, one European non-commissioned officer, eighty non-European ranks. In addition, one officer obtained leave of absence and voluntarily did duty with the company throughout the march.

*Health.*—The general state of health was excellent. It could not be arranged for a medical officer to accompany the column, and, as the event happily proved, his services would not have been required. There were about a dozen cases of sudden rise of temperature (up to 103° or 104° F.) on the march, presumably due to sun, but they were quickly relieved by doses of diaphoretic, the patients recovering, and all marched into bivouac with the company. There was no other serious sickness, and up till now, eight days after the completion of the march, only one man has been admitted to hospital for climatic diseases. The men paid great attention to the care of their feet, and in consequence were little troubled with blisters. There was only one instance of a man being unable to keep up from this cause. The average weight of the men before starting was 11 st. 5 lb., and immediately after their return 11 st. 2 lb., showing a loss per man of 3 lb.

*Transport.*—Each European was allowed five carriers a day. This is a trifle below the usual scale. The men required no carriers for personal kit. Whatever was necessary they carried upon their persons, in accordance with regimental arrangements. Twenty-seven carriers in all were employed on behalf of the men, viz.: For groceries twenty, for medical stores two, for camp kettles, &c., three, for cash-boxes two.

*Clothing and Equipment.*—The total weight carried by a man under regimental arrangements, in addition to his rifle, accoutrements and the clothing he stands in, is 7½ lb. This includes a waterproof sheet (in lieu of blanket or greatcoat). The men were unanimous that in spite of the very cold nights we several times experienced, the ground sheet is on the whole preferable to a blanket or greatcoat, as it is lighter, and does not increase in weight in wet weather.

I gave each man an enamelled drinking mug. This proved a most useful addition to his equipment, and indeed, appears essential when men have to cook for themselves in their mess tins.

The equipment was apparently thoroughly sound when we started, but much of it soon became unserviceable. It is of the 1888 pattern and possibly has been a very long time in store. It is necessary to carry an ample supply of mineral jelly for softening boots. Many streams have to be waded during a march in this country, and the sun hardens the wet leather very soon, blistered feet ensuing if it has not not been kept thoroughly greased. In the present case the supply of mineral jelly was inadequate, and the lack of it was just beginning to be felt at the end of the march.

*Rations.*—The money allowance in lieu of rations was drawn for every man, pooled, and administered by me. This, with the addition of the daily stoppage for groceries, was ample for the purchase of all food required, and about one-eighth of the total amount has been divided amongst the men after the payment of all charges. A daily grocery ration as follows was carried for each man: Sugar ¼ lb., naval cocoa 1 oz., salt ½ oz. A reserve of 1 cwt. of oatmeal was also carried, and sufficient rum to permit of three rations a week being issued. Otherwise the men subsisted entirely on what was obtainable in the districts traversed. It was not possible for them to obtain bread or tinned food for twenty-five days, and for that period it is certain they had to eat country food. Vegetables were plentiful in most towns, *e.g.*, plantains, cocos, yams, cassava, beans, peas, sweet potatoes; and fruits such as oranges, pawpaws and bananas were frequently obtainable. Cattle, sheep and goats were also found in varying numbers, but the natives were unwilling to part with their live stock as a rule. I bought rice in bulk and issued a ration of ¾ lb. daily. Beef was bought on the hoof once a week, and on each occasion the animal killed gave 160 lb. of good meat, or just 1 lb. of meat per man for two consecutive days. For the rest, each man provided himself with such food as he required out of the money allowance, varying from 3d. to 6d., issued to him daily.

The soldier's daily ration therefore was: Rice ¾ lb., sugar ¼ lb., salt ½ ounce, cocoa 1 ounce, fresh meat 1 lb. twice a week, vegetables and fruit such as he bought himself, rum, about ½ gill three times a week.

When marching at an early hour in the morning oatmeal for porridge was issued, the ration being about 2 oz. per man.

*Notes on the Food.*—The West Indian is not by up-bringing a rice eater, as rice is not a staple product of the islands from which he comes. Neither does he eat much cassava. His principal food in his own home is sugar, yam, coco, plantain, bread fruit, &c., with the addition now and then of salt fish or meat. He has after enlistment become accustomed to, and thinks that he needs the ordinary ration of bread and meat. Now rice and cassava are the two principal crops raised in this Colony. My attention, therefore, has during this experimental march been directed to observing to what extent the men have eaten these foods.

I am able to state that they made rice the basis of their meals in almost all cases. In the early morning they cooked sufficient rice to last them through the day's march, carrying it in their mess tins. On one or two occasions, when vegetables were scarce, they were contented with the rice alone, and an extra ¼ lb. was issued. There was certainly a general desire for something like meat, or salt cod, to cook with the rice, and the men's idea was, with which I agree, that ¼ lb. meat daily would have been much better than the 1 lb. twice a week that was issued. As to cassava, the men ate it fairly; but they naturally took yams or coco instead when they could get them.

When they had settled down to the change from barrack fare to bush fare, I noticed that the men fed themselves as follows: At *reveille* they were given about ¾ pint of cocoa prepared by the company cooks. They immediately set about cooking some rice to carry during the march. Meanwhile they would perhaps be roasting a plantain or coco, or the like, to eat with the cocoa. As to the rice there is a general prejudice against keeping it for long in a mess tin after it has been cooked, as from experience they feared it turning sour and giving them diarrhœa. They therefore would not cook it overnight, and if an early start was necessary they could not cook it in the morning without breaking into their rest. On such occasions I issued porridge, prepared by the company cooks, which the men are very fond of, and find very sustaining. On this early breakfast they were able to march until about midday, and then they had a light or heavy meal of rice, beans, yams, or whatever vegetables they fancied or could procure, according to the distance that might remain to be covered that day. During any halt that was long enough many of the men would seize the opportunity to roast a plantain or a head of maize. On arrival at the day's halting place they would prepare another meal of rice and vegetables, cooking with it any meat available. Sometimes two or three men would join forces and buy a fowl, or perhaps a villager might kill a pig and retail it. From my observations I am able to say definitely that the men liked rice, that is, the rice grown in Sierra Leone, and they were prepared to eat more than I gave them if vegetables were not forthcoming. Indeed, some men occasionally bought extra rice for themselves (quite unnecessarily, as they could have had more from store for the asking). I doubt if they would care for imported (East Indian) rice to the same degree, as it is not so nourishing. Cassava they will also eat.

The salt ration was inadequate. When each man prepares his own meals he needs more salt than the ordinary ration.

The sugar and cocoa rations were adequate, and not too large. Rum is the West Indian's natural drink, and he appreciates it very much at the end of a day's march.

*General Conclusions.*—The march has, I suggest, clearly demonstrated the ability of the West India soldier to subsist on the country in Sierra Leone, to say nothing of any other part of West Africa, provided certain groceries are carried for him. As, however, the natives in warfare hide all foodstuffs that they cannot remove, it is necessary for troops operating against them to carry their supplies with them, for little besides cassava would be obtainable in the affected districts. The men have kept very fit and marched well on the grocery ration mentioned before, together with meat twice a week, ¾ lb. of rice daily, and whatever vegetables they might like to buy. It remains only to determine suitable equivalents for the vegetables. The simplest equivalent is another ¾ lb. of rice.

*Recommendation.*—I believe that a suitable scale of rations for the West India soldier for active service in West Africa will be found in the following: Rice (Sierra Leone grown) 1½ lb., meat ¼ lb., sugar ¼ lb., cocoa, naval, 1 oz., salt 1 oz., oatmeal 2 oz., vegetables (when obtainable, reduce rice in proportion, but rice not to be less than ¾ lb.), lime juice (when fresh vegetables are not obtainable), rum ½ gill.

# Travel.

## A VISIT TO A WEST AFRICAN GOLD-MINE IN 1907.

By Lieutenant-Colonel T. E. NICHOLSON.
*Royal Army Medical Corps* (*R.*).

In December, 1906, I was asked by the Secretary of the Liverpool School of Tropical Medicine whether I would care to temporarily accept the post of Medical Officer to a West African Gold-mining Company, as the Directors had specially applied to the School for an expert in tropical sanitation to look after their gold-fields in the Gold Coast Colony. Travelling has always been my favourite hobby, and the further afield that I can get—especially if out of the way of the ordinary tripper or tourist—the better pleased I am; consequently, the chance of seeing Kumasi and the wild West African "bush" was one that I could not deliberately throw away; I therefore accepted, subject to the approval of the War Office authorities.

I left Liverpool on January 5th, 1907, in the ss. "Karina," and I was so fortunate as to meet on board several friends and acquaintances, most of them Army officers, whom I had previously known in other parts of the Empire and who were now employed as Consuls, District Commissioners, &c., on the West Coast of Africa. Las Palmas, in the Canary Islands, was the first port of call; but this place is doubtless too well known to most of us, owing to its being a coaling station for troopships during the Boer War, to merit any description here. Five days later we called off Konakry, in French territory, to land a few passengers, and later on the same day we anchored in the harbour of Freetown, in Sierra Leone. Here I spent a very pleasant time ashore, and was one of those asked to Government House to afternoon tea.

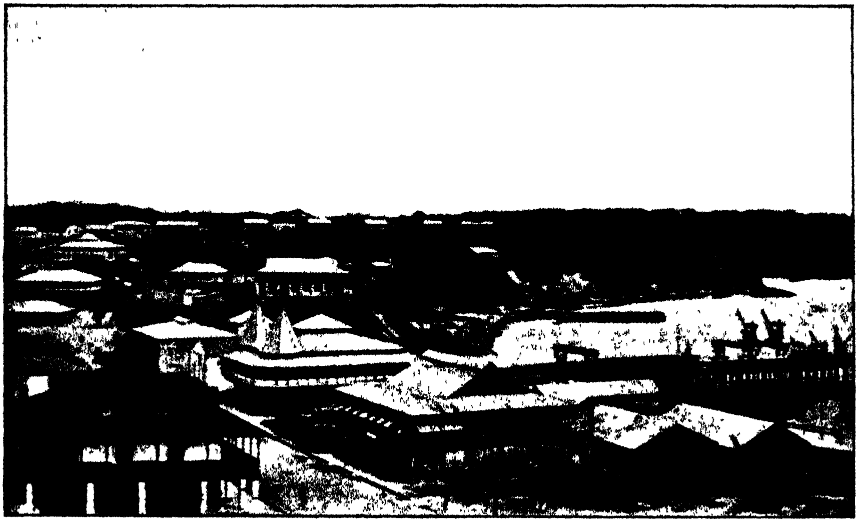


FIG. 1.—View of Sekondi, Gold Coast Colony.

The following day we called at Monrovia to land the British Consul-General for Liberia, but much time was lost in doing so, owing to the tedious delay of the lordly natives in sending out a launch to convey him ashore; it was generally supposed that they had first to fill the boilers, and then light the fire and get up steam, although previously warned by telegram as to the date and hour of our arrival—a fair test (as I then thought) as to their fitness generally for self-government! Early on the morning of the 18th we stopped off Axim to land the mails, and soon afterwards rounded Cape Three Points; two hours later we anchored in the roads of Sekondi, after a very quick passage of barely thirteen days from Liverpool. Here I left the ship. There were several passengers for Sekondi, and although there is a good pier here we had all to land through the surf, which was running very strong that day, and then we had to wait for our heavy luggage. There was also much uncalled-for delay in getting it through the Custom House; I was waiting outside on the beach for over two hours, but I was relatively lucky, for some of the luggage was not cleared until the next day, so that after all Liberia was not so very much behind an old-established British Colony; but I had not then discovered that I was now in the land of "softly, softly"—the favourite catch-word out here for covering all deficiency in zeal, which is evidently not considered good form and only to be looked upon as a marked disqualification for popularity.

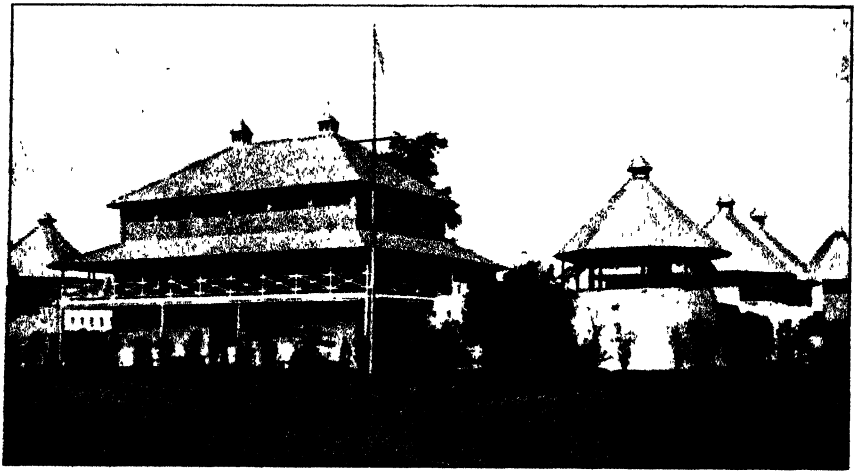


FIG. 2.—The Fort, Kumasi (Ashanti).

The Hotel Metropole was fortunately full up, so I had to be accommodated outside with a bedroom in the private bungalow of one of the residents, where I was made most comfortable. I, however, dined at the hotel, but the place was in possession of a lively holiday crowd of miners, who seemed bent on making a night of it, and the atmosphere was "cerulean," to say the least, so I was a much-envied man for being able to quietly escape from the inferno.

Early the next morning I left for Kumasi, and as I was travelling by the special "boat-train" I was able to reach my destination that same evening, otherwise I should have had to spend the night at Obuassi. I was made most welcome by the officers of the Gold Coast Regiment, and dined with them that night. The next day I was asked to luncheon with the Commissioner in the historic Kumasi Fort, and was afterwards taken round by him to see the town and neighbourhood. Amongst the sights, I was shown over the prison, and there I was allowed to inspect the apparatus for the execution by hanging of three condemned murderers, who were callously awaiting their doom, which was to take place within the week; the arrangements were most humane and unobjectionable, and death ought to be instantaneous. I was also shown the historic Juju-tree, which is now, happily, free from its ghastly human ornaments, but if it could relate all its experiences, the tale would be a lengthy one of almost unparallelled cruelty and suffering.

Early the next morning I started to retrace my journey by rail as far as X., where I left the train, and with it practically also civilisation. Here I met some more men who were proceeding to the same place that I was eventually bound for, and I soon had an insight as to what I might expect for the next few months. Ten of us sat down to dinner together. The conversation soon became lively and general and consisted mostly of "shop." Before the meal was over I was quite *au fait* with *shafts* and *winzes*, *levels* and *drives*, "*stoping*" and *timbering*, *amalgamating* and *cyaniding*, and I was soon able to follow, more or less, a wordy contest between the representatives of the mining and milling departments respectively.

The following morning I started for a four days enjoyable march though the glorious evergreen "bush," or African forest, and I was most lucky in having very fine weather all the way. The only drawback (as I then thought) was that for three nights I had to sleep in negro huts, which had been specially vacated for our party. I had my own portable bed and mosquito curtain, but possibilities of jiggers, malarial parasites, small-pox, skin diseases, as also of snakes, scorpions, centipedes, ticks, and floor-maggots, would continually force themselves on my imagination; furthermore, I was not yet inured to the "*bouquet d'Afrique*," but it is astonishing how soon one gets to be more or less accustomed to these little drawbacks to an epicurean existence.

On the afternoon of the fourth day's march we reached the boundary of the gold-fields which formed our final destination, and here we met the local fife and drum band, which had marched some three or four miles out from Chrysolite (the name which I have given to this gold-mine for the purposes of this Journal) to welcome back the popular manager who was to have come with our party, but who had unfortunately been detained by business at Sekondi. The band now headed the procession to escort us into Chrysolite with musical honours, and raised the devil's own din and dust at the same time, and as the performers were rather more than half naked and the road lay through a long and narrow clearing, with a tropical burning sun shining down in full force on our heads, the atmosphere soon became almost unbreathable for Europeans, and altogether the afternoon of my triumphal—but unpleasant—entry into Chrysolite will never be forgotten by me, for to make matters worse, not only had the eight men whom our party had been sent to relieve not started on their return journey, but a judge and a barrister had also just arrived from the coast in order to try a boundary case between two rival native chiefs who were prepared to fight over the matter, and these gentlemen had to be put up in the best rooms in the camp, so that the crush and overcrowding in the hutments—which at the best of times were not adequate to the

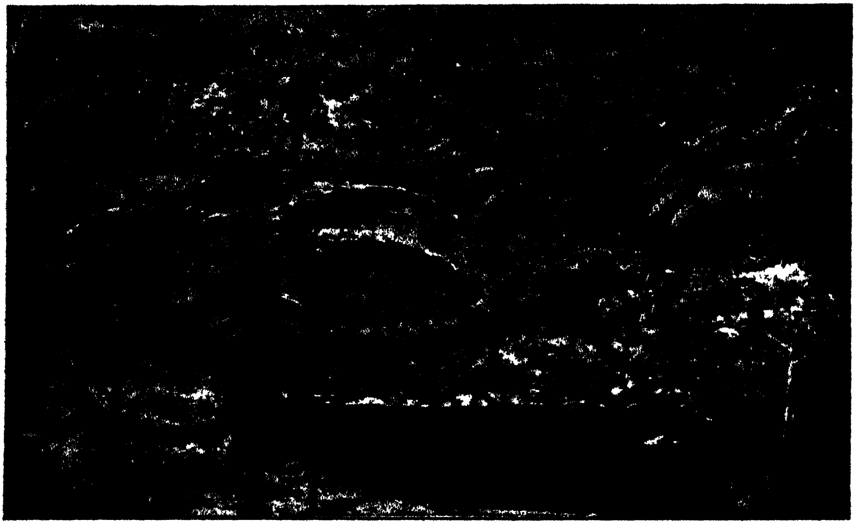


FIG. 3.—A scene in the heart of the African "bush."

vicissitudes of the climate—were the cause of much unparliamentary language for the next week or so.

The day after my arrival at Chrysolite I began to look into matters, and I was horrified at first at the magnitude of my task, for the whole camp was one huge object-lesson in insanitation. Tins, bottles, and rubbish of all sorts, apparently for years, had been scattered broadcast over the camp, which was generally filthy. The surface drains for storm waters were all blocked with tall rank vegetation, and their sides in many places had fallen in ; stagnant and slimy pools were frequently to be met with. The earth-closets for the Europeans were in a loathsome condition, with insufficient seat accommodation ; one was roofless, and situated at such a distance from the huts that it was *not* used at night. There were no latrines for the 3,000 odd native employees, so that the neighbourhood of many of the buildings and adits was in an indescribable condition. None of the huts (with the sole exception of the Manager's bungalow) were altogether suitable to the tropical climate, and several of them were in every way unsuitable, even at the best of times; not every man had the luxury of a room to himself. Those of the huts which were raised off the ground were simply acting as shelters for a luxuriant growth of vegetation, which not only harboured reptiles and insects of all sorts, but also served to screen the misdeeds of the "boys," who seemed to have been chosen from the lowest and most useless types of natives. There was hardly a filter in decent working order. Even the surgery was filthily dirty, and exhibited a condition of carelessness and neglect more than verging on sinfulness; the surgical instruments and appliances had been shamefully kept, many were missing (especially knives and anything that would cut); nothing had been kept under lock and key, and the medicines and drugs were hopelessly jumbled up on a series of high shelves. The meteorological instruments were mostly defective or useless. This matter I considered my first duty to put straight, and after getting the whole place emptied and then thoroughly cleaned, I was occupied for yet another eight full days before the surgery and dispensary were arranged to my satisfaction.

The provision store next claimed my attention, and much that was old and putrid was condemned and destroyed.

I next tackled the latrine arrangements. All the European earth-closets were carefully cleaned and put in good repair; some were moved to more convenient sites, and two extra ones were asked for; sand-boxes were supplied, and hand-shovels, brooms, and latrine-paper were requisitioned for from England. For the natives, I caused four huge trenches to be dug in different parts of the camp; these were 4 feet wide, 8 feet deep, and varied in length from 20 to 45 feet; these trenches were then crossed by beams or logs at about 9 inches interval, and on any two of these the natives squatted; these latrines were then neatly finished off and carefully screened from view by growing shrubs.

There was a large fruit and vegetable garden—much too large in my opinion; but on my arrival it was a perfect wilderness, and well on its way back towards reversion to the jungle. I had it carefully cleaned out, although this (as indeed did fully nine-tenths of my work) caused me to remain out in the sun from early morn to dewy eve, to personally supervise matters, for I could trust nobody. From henceforth, every week I personally issued out the seeds (which were sent out monthly from England), and saw them planted, and I was thus able during the remainder of my stay at Chrysolite to keep up a continuous and abundant supply of fresh vegetables (*e.g.*, lettuces, endive, mustard and cress, red and white radishes, carrots, turnips, parsnips, beetroot, beans, peas, tomatoes, cabbages, yams, cassava, coco-yams, spinach, and sweet potatoes). There was also an abundance of bananas and pineapples, which were the only fruits locally obtainable; potatoes were received from the Canary Islands every month.

The meat was always carefully inspected by myself early in the morning before it was allowed to enter the cook-houses, and after a time I also insisted on inspecting the animals both before and after slaughtering. The kitchens were inspected daily at odd hours, and the kitchen refuse was taken away twice a day to pits specially reserved for this purpose.

The undergrowth—and the rubbish which it concealed—was removed from under all the huts that were raised off the ground, and the earth was afterwards levelled and beaten down, and attended to once a week. An iron bin, painted red, was now placed outside each room as a receptacle for tins, bottles, paper, banana-skins, &c., &c., and emptied by the permanent scavengers every morning.

I daily employed a fatigue party varying from four to ten men, for close on three weeks, simply at clearing away the empty pots, tins, and broken bottles, &c., &c., and then removing them to a short distance in the bush; but this work seemed never-ending, so at last—for one week—I commenced to stack this particular kind of rubbish where all those in the camp could see it, and then everyone marvelled at the quantity which was thus collected in so short a time; but this object-lesson was soon forgotten, for although the overworked Manager always gave me what assistance he could, I appealed in vain to the other European employees to help me to keep the place clean and tidy, for they were, as a rule, too indolent, slack, and apathetic themselves, and simply allowed their "house-stewards" to do as they had always done.

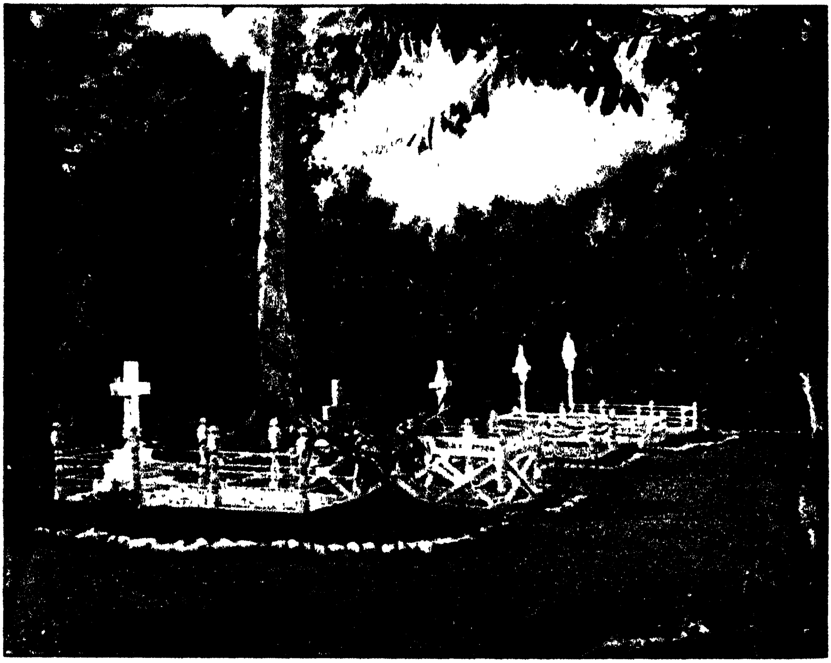


FIG. 4.—A corner of an African gold-mining cemetery, in process of reclamation from the Bush.

The storm-water trenches were carefully cleared of all vegetation and put in repair; stagnant and fœtid pools were filled in, and swampy parts were drained. The paths were cleared, widened, put in order, and gravelled wheresoever this was feasible, and fresh ones were made where required. The jungle was cleared from those huts which actually abutted on to it, and the clearing was afterwards extended further away from all the huts.

I also took the cemetery in hand, or rather what passed muster for such! Hitherto, when a European died he was taken to a grave dug in the bush, and a pile of stones was left to mark the place. Within three months after my arrival I had reclaimed all the graves that I could find, and caused them to be cleared of stones and then fitted with suitable tomb-railings; the cemetery, as a whole, was now defined, cleared, and fenced-in with barbed wire, the entrance being fitted with a lych-gate with a suitable superscription on its outer gable-boards; paths and lawns were made, and then palms and flowers were added for a finishing improvement, and before I left I was congratulated on having made the prettiest cemetery in all West Africa, and I have just heard that it has been consecrated by the Bishop of Sekondi, who specially visited Chrysolite for this purpose.

I may now mention that several of the adjoining villages had grown together into one large composite town of over 10,000 inhabitants, which has been carelessly permitted to entrench on the precincts of the camp, and I fear that the very close proximity of this town will be a very possible source of danger in the near future, not only to the inhabitants of the camp at Chrysolite, but also to the whole district; for if once cholera, plague, yellow fever, enteric, pernicious malaria, or malignant small-pox, &c., appear here, these diseases will probably have come to stay, owing to the conditions being highly favourable for their development. But the relative modernisation of the town of Chrysolite, with its narrow and crooked streets, almost impassable lanes, and long heritage of sanitary incompetence, will probably soon be a matter of considerable difficulty, and possibly also of expense, if vested rights have foolishly been allowed to spring up, and thus render sanitary reform practically prohibitory on the score of the price demanded for compensation.

The climate of Chrysolite is, fortunately, not a deadly one, but in common with the rest of West Africa it is not altogether favourable for Europeans, although much might be done by prophylactic measures, if they could only be enforced strictly.

The water supply for Europeans was good; it was derived from a natural spring about three-quarters of a mile away from the camp, and the spot where it issued from the hillside was completely covered in by a wooden building, the door of which was fastened by a lock and key, the latter being kept in the medical officer's quarters. A special set of men were detailed permanently as water carriers, and they did nothing else, but at the same time their occupation was no sinecure, as they had to walk many miles altogether during the day carrying heavy loads. The provisions supplied were very good, and well cooked as a rule, and there was no stinting of food. Fresh meat (beef, mutton, and goat) was issued on six days in the week, and tinned Army rations once a week only, generally on Tuesdays. Wines and spirits of good quality were issued at cost price and to the European employees only, but the men in the second-class mess were restricted to one bottle of spirits a week, and even these requisitions had to be countersigned by the medical officer; this step was taken partly in the interests of the men themselves, and partly to prevent loss of time through intemperance. Sparklet-bulbs, for aerating the drinking-water, were issued free to all Europeans. There were two excellent tennis-courts, which were practically the only form of recreation obtainable, and they were in great request from 5 to 6 p.m. daily.

A short description of gold-milling may now perhaps be interesting to those who have never seen the process. I may here state that gold is found in all parts of the world, even in England, also in sea-water; but it is often found only in such small quantities that it cannot be obtained at a profit. At Chrysolite the methods of extracting gold from the ore are now conducted on scientific principles. The ore is carried in trucks direct from the different levels of the mine to the rock-breakers or crushers, where it is coarsely broken up, and the pieces then fall by gravitation into the mill, where they are crushed small by heavy iron stamps, on which water plays; the water next flows through a screen, carrying with it the finely crushed ore and gold, and then passes over amalgamating plates on which the greater part of the gold is now deposited. The amalgam of gold and mercury is then collected by scraping the plates, and, after coarse purification, it is squeezed through canvas into hard balls, which in their turn are then retorted (whereby the mercury is distilled off and then collected again under water), leaving the impure gold in the retort; this gold is next melted in a crucible in a hot furnace, and the more or less pure residue, cast in moulds, is henceforth known as "*bullion.*" The residue from the mill, known as "*tailings,*" now passes into tanks, where it undergoes treatment by cyanide, which enables much of the suspended gold to be recovered. What remains in the tanks is known as "*slimes,*" and this, until comparatively recently, was considered worthless and cast out on to the dumping-ground, but now it is also made to deliver up its quota of the precious metal. At Chrysolite developments are somewhat checked by the difficulties of transport and the increased expense entailed thereby.

With regard to professional work, I saw very few tropical diseases of much interest. The greater number of cases amongst the Europeans was due to malignant tertian ague, or to accidents incurred in connection with their work. Amongst the natives, the medical cases seen by me suffered usually from "fever" (uninfluenced, as a rule, by quinine, but yet not tick fever), yaws and dracunculus, also, occasionally, small-pox; but the large majority of the native cases were caused by wounds (often very severe) as the result of accidents, usually due to their own carelessness or foolhardiness. As a rule, even the very severe injuries healed up well, and the natives were not very much afraid of the knife. They seemed to dread having anything in the shape of a tumour, and I soon had a good deal of experience in the surgical removal of lipomata and fibromata. When consulted about one of these tumours, I was usually asked to "give it a soul, and make it live, and then kill it!" and this was evidently the gentle idea of the native "medicine-man," who had manifestly tried his hand on the patients before they came to see me, for every kind of swelling bore obvious marks of previous treatment, either in the shape of tiny scars resulting from free scarification as if with a lancet, or else a biggish central scar which appeared to have been caused by a stab from a red-hot spear-head.

Although, as a rule, it is contrary to native etiquette for women to be treated by a European, nevertheless they are all daughters of Eve, and therefore as keen as to their personal appearance as any West End beauty, and as a special mark of favourable condescension I was often graciously permitted to play the part of "beauty-doctor" to them; one buxom female even came from a village nearly 40 miles away to get an ugly and inflamed and foul-smelling wen removed from her cheek, which had evidently undergone much in the way of unnecessary preliminary treatment before I was privileged to look at it. The chief causes of disfigurement were large fibrous tumours—often as big as golf balls—growing from the lobes of the ears, and one of these once gave me some little trouble and blunted two of my best scalpels before I could remove it. On section of this tumour afterwards, I found in its interior a piece of steel about $\frac{1}{8}$ inch in length, which appeared to have belonged to a stout tapestry-needle: the good lady professed to have no recollection as to how it came to be there, but I am inclined to think that it had been plunged, when red-hot, into the swelling (with a view to causing suppuration and subsequent dispersal), and that it had broken off short and had acted only as an irritant, thus causing the tumour to increase in size.

I had always to be my own chloroformist, assistant, and operator, all in one, as the native dispenser who was supplied by the Company was more of a nuisance than otherwise on these occasions, although he came in very useful for first-aid work and took a good deal of the minor work off my hands, thus leaving me free to supervise my sanitary work and to attend to the more important cases.

During my last month's stay at Chrysolite I was asked by the entomologist at the Liverpool School of Tropical Medicine to collect tabanidæ, mosquitoes, &c., for the School, and by the next mail he was kind enough to send out all requisites for the purpose. Although I had not much time to devote to this sort of work, I did what I could, and soon had started quite a small collection of insects, but one afternoon a favourite little white-nosed monkey frayed its rope through, and then on regaining its freedom simply ran amuck about my room, and after first sampling, and then breaking several of my bottles of microscopical staining fluids, and my last bottle of "Black and White," finally made his afternoon tea off most of my specimens, in spite of the pins by which they were fastened. On my return I chased it more in anger than in sorrow, but the poor little animal had the good sense—or the good luck—to make itself scarce until the following day, by which time the greater part of my indignation had blown over, when I was once more willing to forgive it, I think for at least the seventy-times-seventh time.

When I had fairly finished my task, although my time was not yet up, I asked to be allowed to return home, as I was fairly "fed up" with the utter thanklessness of the whole job, and I gladly handed over my charge to my successor.

I wish to place on record my deep sense of gratitude to the Manager, who did his best to help me as far as he was able to do so, as well as to make me comfortable, even to the extent of allowing me to have all my meals in his bungalow—a privilege extended to no one else.

Although I am not over keen to repeat my experiences, I do not, on the whole, now regret my "visit to a West African gold-mine."

# Reviews.

CATARACT EXTRACTION. By H. Herbert, F.R.C.S., late Lieutenant-Colonel, I.M.S., Professor of Ophthalmic Medicine and Surgery, Grant Medical College, and in charge of the Sir Cowasjee Jehangir Ophthalmic Hospital, Bombay. 391 pp., 97 illustrations. Demy 8vo. Price 12s. 6d. London: Baillière, Tindall and Cox.

This book has grown out of an earlier publication, "The Practical Details of Cataract Extraction," of which two editions were published in 1903. A review of the work appeared in the Journal during the same year. The book has now been very largely amplified, and contains every detail in regard to the subject on which it bears. The author opens his preface with the remark that the volume embodies an experience of about 5,000 extractions, but modestly adds that this is a comparatively small experience for an ophthalmic surgeon of standing in India. He states that an attempt has been made to present an up-to-date treatise, as complete as desirable from a practical point of view. In this effort, we consider that the author has fulfilled his claim. A more comprehensive, and at the same time explicit, description of all matters connected with cataract and the operation for its cure would be difficult to find. The volume is divided into six chapters. The first describes the varieties of operable cataract. The second gives a full account of the operation, consisting of some 136 pages, and shows many excellent illustrations of instruments and steps of the operation taken from photographs. The difficulties and dangers which may arise during the course of operation are pointed out. The third chapter deals especially with two of these accidents, namely, expulsive hæmorrhage and prolapse or loss of vitreous. Chapter IV. embraces a full description of the variations in procedure, with fair and unbiased criticisms of the author on their respective values. The fifth chapter is devoted to the many subsequent complications which may arise, and the best means of combating them. The last chapter deals with the treatment of complicated and soft cataracts.

The book is printed on good paper, in excellent type, and the illustrations are clear and carefully produced. For those interested in this subject, the volume can be recommended as very well worth its price.

C. E. P. F.

THE THEORY OF IONS: A CONSIDERATION OF ITS PLACE IN BIOLOGY AND THERAPEUTICS. By William Tibbles, M.D.(Hon. Causâ)Chicago, LL.D., &c. London: Rebman, Limited, 1908. Price 2s. 6d.

This book, dealing with the theory of ions, has been drawn, as the author states, largely from Newth's "Inorganic Chemistry," Pauli's "Physical Chemistry in the Service of Medicine," Barker's address at the British Medical Association, Toronto, 1906, and from other sources.

It forms a valuable handbook on the subject, although much of it appears in a somewhat elementary form.

In an introduction the author states his views as to the origin of the living from non-living substances, by the ionisation of material and formation of what he terms meres, and has endeavoured to place the theory of ions before the reader, and to show that ions occupy an important place in biological processes.

The sections dealing with the construction, evolution, and synthesis of proteins are lucid and well explained, and the examples given are interesting.

Sections V. and VI. are well worthy of careful perusal by those interested in the subject, as they contain probably the best matter in the book.

W. W. O. B.

THE SEXUAL DISABILITIES OF MAN AND THEIR TREATMENT. By Arthur Cooper, M.R.C.S. 184 pp., 2 illustrations. London: H. K. Lewis, 1908. Price 4s. net.

In this little volume the causes and treatment of impotence and sterility in the male are dealt with clearly and practically. The subject is one that receives but scanty notice in ordinary text-books, and erroneous ideas upon it are widely prevalent among patients, and to a less extent among medical men. Hence, as is well known, these disorders offer a lucrative field to the enterprising quack. The long experience of the author enables him to speak with authority, and the opinions he expresses are well worth the attention of every medical man. The book can be recommended to all interested in the subject.

PHYSICAL SIGNS OF DISEASES OF THE THORAX AND ABDOMEN. By James E. H. Sawyer, M.D.Oxon., &c. 180 pp. London: Baillière, Tindall and Cox, 1908.

This little book has been written as a help to medical students in their earlier studies, and there is no doubt that it fulfils the object with which it has been written as far as any elementary work could do, but it is open to question whether the physical signs of disease, though carefully enumerated and tabulated, are thus put in their most attractive form; still the keen student will find the book a great help in his routine examination of the patient where it is necessary to go through the recognised methods of examination, viz., by inspection, palpation, mensuration, succussion, percussion, and auscultation. These are all carefully dealt with in detail, and the various causes of deviation from the normal explained.

On page 8 we notice what is probably a printer's error, namely, that stertor is produced by expiration; this snoring sound being of course due to vibrations set up in the soft palate during inspiration, and usually caused by breathing through the mouth and nose at the same time. Topographical anatomy is briefly but accurately dealt with. Rhythm, character, propagation, &c., of cardiac murmurs are clearly explained. The examination and signs of the chief diseases of the organs in the abdominal cavity are similarly pointed out and explained. The book will be read with great advantage by those for whom it was intended, and also by medical men who may have become somewhat stale or careless with regard to making a routine examination before coming to a diagnosis. We specially recommend it to those who are going up for a course of clinical studies previous to the promotion examination, when well-defined methods will be both a help to study and an advantage in the day of trial.

G. J. S. A.

ON THE LODGING OF DIRECT OR RICOCHET BULLETS IN THE HUMAN BODY AND THE HEALING OF WOUNDS OVER LODGED BULLETS. (Ueber das Steckenbleiben und Einheilen von direkten und indirekten Geschossen im Menschlichen Körper.) By Friedrich Hemme. Pp. 55. 8 inches by 5¼ inches. Berlin: Gustav Schade, 1906 (?) 1s. 2d.

This pamphlet is the thesis for the author's doctorate in medicine at the University of Berlin, and is based on an examination of the literature of the subject and not on personal experiments or practical experience. In the concluding portion of his dissertation he discusses the probabilities of bullets lodging in the body, and points out that experiments on horses or dead bodies, according to Demosthen's experiments, are unreliable as regards the amount of lodging in the human body. In sixty-six cases, the bullet lodged ten times in the human body, only five times in a living horse, and five times in the dead body. The author's conclusions do not add to our knowledge. They are, that in virtue of its small calibre, greater power of penetration and greater resistance, the modern bullet makes smaller openings and cleaner cut tracks than the lead bullet, it carries fewer foreign bodies into the wound, is seldom deformed, lodges less frequently, and the wounds heal sooner in consequence of modern methods of treatment. W. G. M.

DRILL REGULATIONS AND OUTLINES OF FIRST AID FOR THE HOSPITAL CORPS, U.S.A. Revised 1908. Pp. 165; numerous illustrations in text. 5 inches by 4½ inches. Washington: Government Printing Office, 1908.

This is the official manual for the training of men of the United States Army Hospital Corps in field exercises, and must not be confounded with the bulky handbook for the Hospital Corps, prepared by Major Mason, and published unofficially, although the latter contains most of the information given in the official drill regulations. It is a small and handy pocket volume, covering much the same ground and in much the same way as the manual for the training of the Royal Army Medical Corps. In some respects it goes further, and gives some useful exercises for loading and unloading patients on and from ships. The tent drill also includes new matter, such as special drills for pitching shelter and double shelter tents. The illustrations are clear and useful. W. G. M.

CONTRIBUTIONS TO THE STATISTICS OF RECRUITING, WITH SPECIAL REFERENCE TO DISEASES AND DEFECTS THAT CAUSE UNFITNESS FOR SERVICE. (Beiträge zur Rekrutierungs-statistik, mit besonderer Berücksichtigung der die Dienstuntauglichkeit bedingenden Krankheiten und Gebrechen.) By Stabsärzt Dr. H. Schwiening. Pp. 20. 7 coloured charts as appendix and 8 charts in text. 9½ inches by 6½ inches. Jena: Gustav Fischer, 1908. 3s.

Fifteen hundred years ago Vegetius, in his "De re militari," wrote that "the military power of the Roman Empire and the foundation upon which its renown rests lie in the preliminary examination of recruits; this duty is no light duty and must not be entrusted haphazard to anyone." This is the text of Dr. Schwiening's pamphlet. He adds to it by saying that it embodies a truth that is all the greater in countries where military service is obligatory, and where the whole male youth of the nation has to be examined by the recruiting medical officer. One of the most important duties, therefore, of the army medical officer is examination of recruits. In this he is greatly helped by recent advances in medical science and in scientific apparatus.

The author's statistical investigations cover the ten-year period 1894-1903. He first of all discusses the percentage of men fit for service with the colours, with reference to increase or decrease and to distribution in different districts. The average number so fit is 57·3 per cent., and there has been practically no increase or decrease during the ten years, although slight fluctuations have occurred. The number of men fit only for service in the *landsturm*, or totally unfit, is 32·3 per cent. This percentage varies greatly in different recruiting districts, and is greatest in Berlin, where it is as high as 71·5 per cent. The eastern districts give the most favourable, and the great towns—Berlin, Hamburg and Bremen, Aix and Hanover—the least favourable results. In these towns there has also been a steady increase in the number of men rejected as unfit.

As regards causes of unfitness, Dr. Schwiening gives the following statistics: Out of every 100 unfit, 25·8 were unfit on account of poor physique, 8·7 for flat-foot, 8·6 for defects of vision, 8·4 for hernia, 7·0 for varicose veins, 7 for defects of joints and limbs, 6·2 for cardiac affections, 3·3 for defects of hearing, 2·5 for pulmonary diseases, 1·8 for mental diseases, and 1·0 for epilepsy. Of these causes the rejections on account of pulmonary and mental diseases and for cardiac affections have been increasing, while others have remained stationary. In the five years 1899-1903, the percentage rejected amongst total recruits examined was 8·6 on account of poor physique, 5·4 for flat-foot and varicose veins, 2·9 for defects of limbs and joints, 2·2 for defects of vision, 2·1 for cardiac affections, 0·83 for pulmonary diseases, 0·61 for mental diseases and defects, and 0·46 for epilepsy. Dr. Schwiening discusses briefly the distribution of these diseases in the different recruiting districts and represents this distribution in the graphic charts in the appendix. The most striking of these is the excessive number of rejections for poor physique and for defects of vision in the Berlin district, for lung diseases in Hanover, Göttingen, and Donaueschingen, defects of vision, equal to those in Berlin, in Eylau, Marienburg and Metz, at the two opposite corners of the empire, and flat-foot in Lübeck. A curious result of the statistical enquiry is introduced at the end, namely, the distinct tendency during the ten years towards increase in height amongst men of the recruits' age. The average height has remained stationary, but all heights below this have diminished, while those above have had a corresponding increase.

W. G. M.

Military Hygiene: A Manual of Sanitation for Soldiers. By Lieutenant-Colonel R. H. Firth, R.A.M.C. Pp. 295. London: J. and A. Churchill, 1908. Price 3s. 6d.

This manual has been written for the guidance of officers and non-commissioned officers. Technical terms have been avoided as far as possible, and in twelve short chapters all the main facts which a soldier should know in order to keep himself fit both in peace and war are clearly stated. The chapter on physical training cannot fail to be of great assistance to those responsible for the development of the raw recruit into the trained soldier. The subject of water supplies is treated very fully, most of the important measures for purifying water being described, and the circumstances most suitable for each method indicated. The last chapter on the hygiene of the march and the camp contains much information which, if put into practice, must have an important influence on the sick-rates in future campaigns. We can strongly recommend the book to all officers of both the regular and territorial forces.

W. H. H.

THE ARMY MEDICAL SERVICE IN FRANCE: ITS DEVELOPMENT AND ITS CAMPAIGNS FROM 1708 TO 1882. (Le Corps de Santé Militaire en France: son évolution, ses campagnes 1708-1882.) By Méd. Maj. Brice and Capitaine Bottet, with Preface by Méd. Insp. Delorme. Pp. 437. 10 plates (8 coloured) and 11 vignettes. Paris: Nancy, Berger-Levrault et Cie., 1907. 20s.

This volume is of great interest to the student of army medical history. One of the authors, Captain Bottet, is a member of Council of the *Musée* of the French Army, and M. Delorme, who writes the preface, is himself an authority on the subject. Apart from the introduction and conclusion, there are eight chapters, dealing with different historical periods and campaigns. The first is the period 1708 to 1792, and contains various legislative measures during the monarchy in connection with military hospitals and a military medical service.

Chapter II. is headed "The Revolution and Humanity," and also deals with legislative measures and projects, including an account of Percy's "Sausage" car for a corps of surgeons with the army on the Rhine and Larrey's field ambulance. The third chapter carries us on from Marengo to Austerlitz, and the fourth from Austerlitz to Fontainebleau. In the former there is an excellent picture of the condition of the French army at Boulogne, and of how the French soldiers were kept employed in all kinds of work, during a period of inaction, in order to preserve their health. Amongst other employments was that of gardening, and there is a short description of the kitchen and flower gardens produced by them. A curious fact is also mentioned, namely, that two doctors, Woodville and Nowell, were taken over from England by the Army Medical School established at Boulogne then, in order to vaccinate the troops. Mention is made of the terrible ravages of enteric fever (*typhus*) after Austerlitz, when 12,000 men are estimated to have died of this disease. The chapter carrying us on to Fontainebleau (1814) is devoted mainly to the campaigns of the Empire in Prussia, Poland, Austria, the Peninsula, Russia, Saxony, and France, and is full of the work of Percy and Larrey. In Chapters V. and VI. there are accounts of the Hundred Days' War, and of the French campaigns in Algeria, together with historical details of legislation and orders affecting the Army Medical Service. Chapter VII. deals with the period 1848 to 1870, and includes the Crimean, Italian, Chinese, and Mexican campaigns. There is also an account of the progress of hygiene and the work of Michel Lévy and L. Laveran in connection with it. The last chapter is devoted to the war with Germany and the campaign in Tunis, a considerable portion being taken up with a discussion of the Geneva Convention and historical facts concerning voluntary aid societies, far from favourable to the latter. The authors quote the reports of Dr. Chenu, who was principal medical officer of the army in 1870, describing the embarrassing interference of would-be doctors, of armchair philanthropists, of society women, of all those who, in the absence of a strong organisation of the medical service, made matters worse, and even neutralised the efforts and devotion of disinterested and useful assistants. The conclusion sets forth the advantages and necessity of autonomy, for which the French medical service strived so long, and obtained by decrees of 1882 and 1889. W. G. M.

OPERATIONS OF GENERAL PRACTICE. By Edred M. Corner, M.A., B.C., M.B.(Cantab.), B.Sc., F.R.C.S., and H. Irving Pinches, M.A., M.B., B.C.(Cantab.), M.R.C.S., L.R.C.P. Pp. 338. Oxford Medical Publications, 1908. Price 15s.

This book gives a very good description of most of the minor surgical operations which a general practitioner may be called upon to perform, and contains several useful " tips " which are not found in the ordinary text-books on surgery, and the reader is not confused by a discussion on alternative methods of operating.

The chapter on modern surgical technique is a clear *résumé* of the subject, and is well worth reading. The notes on anæsthetics are good, and the book as a whole appears to be thoroughly up to date.

F. E. G.

# Current Literature.

**Increase of Height in Young Men of Military Age in some of the European States.**—In the *Deutsche militärärztliche Zeitschrift* of May 20th, 1908, Stabsarzt Dr. Schwiening, of the War Office, Berlin, brings forward some interesting facts connected with a tendency towards increase in height, which he had previously observed, and to which he had drawn attention in a short article on recruiting statistics.[1] In his present article he gives further statistics, not only from Germany, but also from Austria-Hungary, Italy, France, the Netherlands, Russia, Norway, and Switzerland, which all go to prove his former supposition, that there is a gradual tendency towards increase in height going on throughout the European nations. In Germany, out of 100 recruits examined during 1894 to 1898 and in the subsequent five-year period 1899 to 1903, the percentage belonging to seven different height groups was as follows, converting the German centimetre measurements to the nearest whole number in inches :—

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[1] "Beiträge zur Rekrutierungs-statistik." Jena : Fischer, 1908.

| Quinquennial period | Under 61 in. | 61 to 63 in. | 63 to 65 in. | 65 to 67 in. | 67 to 69 in. | 69 to 71 in. | Over 71 in. |
|---|---|---|---|---|---|---|---|
| 1894-8 .. .. | 3·8 | 11·3 | 26·8 | 30·2 | 19·5 | 7·0 | 1·6 |
| 1899-1903 .. .. | 3·6 | 10·4 | 26·2 | 30·2 | 20·4 | 7·4 | 1·8 |
| Increase or decrease | −0·2 | −0·9 | −0·6 | +0·0 | +0·9 | +0·4 | +0·2 |

In other words, there was a decrease in the number of men belonging to the lower heights, the middle average height remained stationary, and there was a distinct increase above the average height. As Dr. Schwiening remarks, it is a somewhat startling fact to discover that this tendency towards increase in height has shown itself so distinctly within the short period of ten years.

Taking Austria-Hungary, he produces statistics of Myrdacz, in which the recruiting statistics for the years 1895 to 1905 are tabulated. According to Myrdacz the following are the percentages of men in seven different height groups:—

| Quinquennial period | Under 61 in. | 61 to 63 in. | 63 to 65 in. | 65 to 67 in. | 67 to 69 in. | 69 to 71 in. | Over 71 in. |
|---|---|---|---|---|---|---|---|
| 1889-93 .. .. | 6·8 | 19·4 | 28·0 | 26·1 | 13·9 | 4·6 | 1·0 |
| 1894-8 .. .. | 6·0 | 18·0 | 28·0 | 26·8 | 14·9 | 5·1 | 1·2 |
| 1899-1903 .. .. | 5·4 | 17·1 | 27·4 | 27·6 | 15·7 | 5·5 | 1·3 |
| 1904-5 .. .. | 4·9 | 16·6 | 27·0 | 28·2 | 16·3 | 5·8 | 1·4 |
| Increase or decrease | −1·9 | −2·8 | −1·0 | +2·1 | +2·4 | +1·2 | +0·4 |

Here again, the table shows a gradual diminution in each five-year period, from 1889 to 1893 to 1904-5, amongst the men of smaller stature, and an increase amongst those of greater stature; further, this increase is almost exactly similar to the increase shown amongst the German recruits. Corroboration of this fact is also obtained from statistics, published by Myrdacz, of men who were rejected as being under the regulation height, namely, 153 cm. (60·4 inches), the number so rejected falling from 3·8 per cent. in 1894, steadily year by year, to 2·2 in 1905.

In Italy again, Schwiening found the following statistics:—

Percentage of recruits in different height groups at age for military service:—

| Quinquennial period | Under 61 in. | 61 to 63 in. | 63 to 65 in. | 65 to 67 in. | 67 to 69 in. | 69 to 71 in. | Over 71 in. |
|---|---|---|---|---|---|---|---|
| 1874-8 .. .. | 10·4 | 23·2 | 30·5 | 22·9 | 9·8 | 2·66 | 0·56 |
| 1879-83 .. .. | 10·1 | 22·7 | 30·7 | 23·3 | 9·9 | 2·74 | 0·60 |
| Increase or decrease | −0·3 | −0·5 | +0·2 | +0·4 | +0·1 | +0·08 | +0·04 |

Although these statistics are not so convincing as the others, because they deal with periods that can scarcely be called modern, they still show the same tendency towards decrease in the number of men of small height, and increase amongst those of greater height.

The statistics obtainable from France do not altogether bear out the general tendency shown by the German and Austrian statistics. The height groups are only five in number, and the statistics given of the percentage of men examined in the different groups are as follows:—

| Quinquennial period | Under 60½ in. | 60½ to 63½ in. | 63½ to 65½ in. | 65½ to 67½ in. | Over 67½ in. |
|---|---|---|---|---|---|
| 1890-4 .. .. .. .. | 3·0 | 28·9 | 29·7 | 28·0 | 10·2 |
| 1895-9 .. .. .. .. | 2·9 | 28·9 | 30·0 | 27·9 | 10·5 |
| 1901-3 .. .. .. .. | 3·4 | 27·8 | 28·3 | 28·4 | 12·1 |
| Increase or decrease .. .. | +0·4 | −1·1 | −1·4 | +0·4 | +1·9 |

The figures show an actual increase amongst the men of the smallest height group, as well as of the greatest, with a decline amongst those of average height.

A similar state of affairs is shown in the Belgian statistics. Schwiening gives the following table from the Belgian Army medical reports:—

Percentage of recruits at the different height groups:—

| Quinquennial period | Under 61 in. | 61 to 63 in. | 63 to 65 in. | 65 to 67 in. | 67 to 71 in. | Over 71 in. |
|---|---|---|---|---|---|---|
| 1885-9 .. .. | 1·4 | 17·4 | 30·7 | 30·8 | 19·1 | 0·64 |
| 1890-4 .. .. | 1·5 | 17·3 | 30·5 | 30·2 | 19·7 | 0·96 |
| 1895-9 .. .. | 2·8 | 15·3 | 29·5 | 32·0 | 19·7 | 0·72 |
| 1900-4 .. .. | 3·5 | 15·1 | 29·2 | 32·2 | 19·3 | 0·71 |
| Increase or decrease | +2·1 | −2·3 | −1·5 | +1·4 | +0·2 | +0.7 |

In this case the increase amongst the men of the smallest height group is great and noteworthy.

The most complete statistics bearing upon the point are those presented by Bruinsma for the Netherlands Army. His statistics deal with men in their nineteenth year only and give the following results. For every 100 men examined there were:—

| Quinquennial period | Under 61 in. | 61 to 63 in. | 63 to 70½ in. | Over 70½ in. |
|---|---|---|---|---|
| 1863-7 .. .. .. | 11·1 | 14·4 | 50·5 | 24·6 |
| 1868-72 .. .. .. | 9·2 | 13·6 | 52·3 | 24·3 |
| 1873-7 .. .. .. | 7·4 | 12·7 | 53·7 | 26·2 |
| 1878-82 .. .. .. | 5·9 | 11·9 | 54·1 | 28·2 |
| 1883-7 .. .. .. | 4·4 | 9·7 | 52·8 | 32·9 |
| 1888-92 .. .. .. | 3·7 | 9·0 | 52·5 | 34·8 |
| 1893-7 .. .. .. | 3·8 | 8·7 | 51·6 | 35·7 |
| 1898-1902 .. .. | 2·8 | 7·4 | 50·3 | 39·6 |
| 1903-4 .. .. .. | 2·3 | 6·7 | 48·3 | 42·7 |
| Increase or decrease .. | −8·8 | −7·7 | −2·2 | +18·7 |

This series of statistics is remarkable in many ways, and shows that since 1863 onwards there has been a continuous and important decrease amongst youths of at least 63 inches in height and under, and a correspondingly great increase amongst youths over 70½ inches in height. Bruinsma in his statistics also shows that this increase in height amongst the people of the Netherlands is not confined to men of military age, but displays itself in the earlier years of life, from 15 years onwards, and that it is associated also with increase in other measurements, especially with increase in the measurement of the circumference of the head.

The statistics from Russia are somewhat limited, but the following have been obtained. Out of over 100 men examined there were :—

| Period | Under 61 in. | 61 to 63 in. | 63 to 65 in. | 65 to 67 in. | 67 to 69 in. | 69 to 71 in. | Over 71 in. |
|---|---|---|---|---|---|---|---|
| 1893-6 .. .. | 8·4 | 18·4 | 27·7 | 25·2 | 14·2 | 5·0 | 1·2 |
| 1897-1900 .. .. | 7·7 | 17·4 | 27·0 | 25·6 | 15·2 | 5·5 | 1·5 |
| Increase or decrease | −0·7 | −1·0 | −0·7 | +0·4 | +1·0 | +0·5 | +0·3 |

So far as these statistics go there is again evidence of decrease amongst men of smaller height, and increase amongst those of greater height.

The statistics of recruiting in Sweden and Denmark do not give details of height, but in Norway they show that the average height of recruits examined is increasing gradually from 66·41 inches in 1878-1882 to 66·93 inches in 1893-1898.

The last country from which statistics of any use in this enquiry were obtained is Switzerland, for which Schwiening gives the following percentage of recruits in the different height groups :—

| Period | Under 61 in. | 61 to 63 in. | 63 to 65 in. | 65 to 67 in. | 67 to 69 in | 69 to 71 in. | Over 71 in. |
|---|---|---|---|---|---|---|---|
| 1884-7 .. .. | 12·5 | 18·1 | 27·8 | 25.0 | 12·4 | 3·5 | 0·6 |
| 1888-91 .. .. | 12·4 | 17·9 | 28·1 | 25.1 | 12·3 | 3·5 | 0·6 |
| Increase or decrease | −0·1 | −0·2 | +0·3 | +0·1 | −0·1 | +0·0 | +0·0 |

Although these figures also show a tendency to decrease in men of smaller height, they are not so remarkable as the figures from some of the other countries. On the other hand, the percentage of men rejected in Switzerland on account of being below the height for military service, namely, 61¼ inches, had fallen from 6·5 per cent. in 1886-90, to 5·6 in 1891-5, 4·4 in 1896-1900, and 3·7 in 1901-5. The number of men, therefore, who have been rejected on account of small stature during the last twenty years has decreased almost by one-half.

The statistics for recruits in England are not taken into account, because, as the author states, we deal with a class of recruits that do not give any indication of the general condition of growth amongst the people, and are not comparable with the statistics of those countries in which compulsory military service for the whole youth of the country is in force.

The article concludes with some remarks as to the probable date of the commencement of this increase in growth and its cause. With regard to the former, the statistics do not go far enough back to enable Dr. Schwiening to arrive at any definite conclusion, although he points out that in the Netherlands, at any rate, the tendency has been going on for forty years, and he also draws attention to the well-known fact that the armour and equipment of soldiers of the earlier centuries are too small for men of average height of the present day. As regards the cause of increase, many factors must be considered. Bruinsma believes that, in the Netherlands, it is due to better nourishment among infants and children, and to better hygiene generally. Schwiening considers that, on the whole, the tendency towards increase of height is a sign of better general social and hygienic conditions, although he cannot deny that, from a purely health point of view, increase in height may, under certain circumstances, be regarded as an unfavourable condition. Increase in length frequently does not correspond with general physical development, and especially with development of the respiratory organs. In fact, tuberculosis, as he himself has shown, is more common among tall people than amongst others. On the whole, he rejoices in the fact that there is this tendency to increase, because it adds to the number of men who are fit for military service, that is to say, the number of men who are rejected for being under height is becoming less; a state of affairs which does not exist in France. W. G. M.

**Dental Equipment in German Garrison Hospitals** (*D.m.Z.*, June, 1908).—Up till now an equipment for dentistry was only allowed in hospitals with 71 to 200 beds; it consisted of a pouch of six tooth forceps only. By instructions of March 20th, 1908, a much more extensive equipment is allowed, and there is no limit as to the size of hospitals that are to be provided with it. Clove oil for relieving pain in inflammation of the pulp is also added to the list of drugs allowed in hospitals.

The addition to the old equipment consists of a right and left side stump elevator, drill, dental syringe, dental probe, right and left excavator, and double stopper. W. G. M.

**Changes in German Field Medical Regulations of 1907** (*Militärärzt*, June 26, 1908).—Field medical regulations of March 22nd, 1908, make the following alterations:—

(1) The first line transport (*Kleine Bagage*), to which the medical cart of battalions, the medical pack animals with mounted leaders, and the field stretchers belong, are now called "fighting line baggage" (*Gefechts Bagage*).

(2) The union of bearer companies and field hospitals is abolished.

(3) The bearer companies (*Sanitätskompagnien*) are integral parts now of an infantry division.

(4) The field hospitals (*Feldlazarette*) belong generally to the supply and transport columns of an army corps, and especially to the two train battalions of the corps, each of which is composed of staff, supply columns, transport columns, and field hospitals. On the march the supply and transport columns are in two echelons; so that certain supply columns and field hospitals may advance, as "fighting *echelons*" (*Gefechtsstaffel*), in front of the second line of transport (*Grosse Bagage*) and in rear of the fighting troops. W. G. M.

# Correspondence.

## ARTIFICIALLY PRODUCED CARDIAC BRUIT.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—Captain N. E. Harding's clinical note on "an artificially produced cardiac bruit" in the July number of the Journal is extremely interesting. It is certainly our lot to have more anomalous cardiac cases to deal with than our brethren in civil practice. Posture, of course, is well known to have in some cases a definite effect on physical signs in the chest; but it is difficult to imagine that the position of the arms can have any.

It was an aphorism of one's hospital days—too often neglected in later years—to examine every cardiac case with the patient first erect and then supine. The only kinds of cases, as far as I am aware, in which one might expect a bruit to be brought into existence in one position of the chest, and to be inaudible in another, are two—and both rare—though I remember an example of each—both verified on the *post-mortem* table. They are: one in which a bruit is generated by the heart in a large pulmonary cavity in close proximity to it; the other in which the murmur is a true exo-cardial one, the result of old pericarditis and a so-called "milk spot" or "corn" on the epicardium over the front of the right ventricle. These would probably both be systolic in time, the first heard at the base, and the second nearer the apex.

But an experience of mine about three years ago affords another and rather interesting explanation of Captain Harding's experience. I give it with diffidence, not knowing the circumstances, nor the kind of duty (pleasant or otherwise) requiring his examination of these men. I was examining a private of very bad character, previous to his undergoing six months imprisonment with hard labour. This individual had twice deserted, and it was his second attempt that led to our acquaintance. He let down his trousers and held up his shirt in front with both hands exactly as described by Captain Harding. With a monaural stethoscope a loud systolic bruit was plainly heard. But shortly this bruit was no longer synchronous with the systole. On taking a binaural stethoscope which enabled one to face the patient and see what he was doing, the bruit was unaltered, but I saw him gently but quite regularly scratching the upper part of his chest with one finger. When he was told to keep his finger still the bruit disappeared. He managed to hit off the rhythm of his heart very fairly well for ten or twelve beats, and the effect was indistinguishable from a true murmur.

Captain J. G. Gill examined the case with me and will doubtless remember it. The man did not appear to think he was detected and tried the same game with both of us. We both considered him eminently fit for imprisonment with hard labour.

I have never before or since met this particular form of malingering.

I am, &c.,

*Nowgong, Central India,* PHILIP DAVY,
*July 29th,* 1908. *Captain, R.A.M.C.*

## THE HEARSEY TREATMENT OF BLACKWATER FEVER.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—After reading carefully Captain Hallam Hardy's article on the Hearsey treatment in blackwater fever, I confess I remain not quite clear in my mind as to what part of the treatment constitutes the "new line." Captain Hardy alludes to (1) the use of morphia to allay the vomiting; (2) to a combination of liq. hydrarg. perchlor. and sodæ bicarb., and (3) to a dietetic practice. I imagine it is (2) which is the "new" treatment; if so, I feel a mild protest is called for. It is an old line of treatment, and was, I fancy, first used by Sternberg. It is, in fact, "the Sternberg treatment" for yellow fever, and has long been used for blackwater on the West Coast of Africa. I have myself seen this line of treatment adopted in several cases, but do not remember being impressed to any degree as to its advantage over other methods. Captain Hardy's figures are indeed striking, but the number of cases recorded is, as he says, small; and applying Poisson's formula, the probable mean error for the series would be very high.

I do agree with, and am glad to notice, the importance Captain Hardy attaches to the use of intravascular saline injections. My experience teaches me that therein lies our great remedial agent for suppression of urine.

May I conclude, Sir, by asking if any of your readers have tried a combination of quinine cacodylate and perchloride of mercury for blackwater? If so I should be very glad to hear of any result, good or bad.

I am, &c.,

D. S. SKELTON,

*August 28th,* 1908. *Captain, R.A.M.C.*

## WHEN SHOULD MERCURY BE GIVEN FOR SYPHILIS?

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—I have read with interest the two letters published under the above heading by Major Porter and Captain Prescott. The former states that a typical Hunterian chancre is rarely seen as a primary lesion. The latter's experience has been diametrically opposite. That I have a simple explanation to offer which may reconcile these apparent discrepancies is my reason for trespassing on your valuable space.

Quite half the cases of syphilis which I have seen have had both soft and hard sores running concurrently as a primary lesion. What usually occurs is this: A man is admitted with a typical soft sore and has perhaps also a suppurating bubo in the groin. In about three weeks or so, the sore or the scar thereof is found to be indurated, and this induration is followed by secondary manifestations; the explanation being that the man has been inoculated with the viruses of the two diseases simultaneously, but the hard sore having a longer incubation does not show itself as such (by induration in the original sore) for some weeks after admission.

I have personally seen very few cases in which syphilis followed anything but a typical chancre, even when on the glans there is a "stiff" feeling about the ulcer which is quite characteristic, and, with the greatest deference, I submit that if Major Porter had examined his cases from time to time, he would have found that the initial soft sores had subsequently become indurated in a very large number of cases. As regards administering mercury, I would withhold it until induration had occurred, but once the typical induration had been demonstrated, which I think can almost always be done after the third week, there is no object in waiting for secondaries to appear.

In many of my cases in which I adopted this plan I have found in a couple of months very faint but typical squamous or macular skin lesions without any other symptoms, showing that the mercury has successfully aborted what might have been a severe attack of secondaries.

With regard to Major French's letter, I think it very doubtful whether mercury *alone* has much effect on the late (tertiary) manifestations of syphilis, although undoubtedly when given in continuous courses it *usually* prevents their occurrence; one often sees men with gummatous lesions being treated by mercurial injections, without result, which yield to potassium iodide at once. It is a great pity that there is no way of observing men for several years after they have finished their course of mercury. I have lately seen several cases of tertiary ulceration in men who have been conscientiously treated by mercurial injections, as laid down, for two years and more. Some of these cases have developed tertiaries six months after the course was stopped. If this is so, how many more may have developed them after leaving the Service?

Perhaps the doses of mercury recommended are too small, or the course too short. My own plan is to give intermittent courses of iodide in addition to the mercury during the last six months of treatment, so as to destroy any tertiary changes which may be commencing but which are not as yet evident. It is possible that potassium iodide may prevent, as well as cure tertiary syphilis.

*Saugor, Central Provinces,*
*July 9th*, 1908.

I am, Sir, yours, &c.,
KEPPEL H. REED,
*Captain, R.A.M.C.*

## THE TREATMENT OF SYPHILIS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—Major F. J. N. Porter, in the August number of the Journal, while extolling the treatment of syphilis by intra-muscular injections, makes the statement that "the treatment of inunction and by the mouth has been well known for a very long time, but these methods are quite inadmissible to Army out-patient practice." This assumption has been made so frequently by advocates of the injection treatment that I think it is time it was contradicted. I can assure Major Porter that during the whole of my service, twenty-one years, I have treated out-patients by the mouth and have never found the slightest difficulty in carrying out the treatment. My procedure has been as follows: When the acute symptoms have subsided the patient has been discharged hospital and a memorandum sent to his commanding officer that he was to attend twice daily in his own time for medicine, but that he was fit for all duties. A roll has been kept by my wardmaster, who reported to me when men did not attend. On reporting non-attendance to the man's commanding officer, he has always been caused to attend and usually also been punished for his absence. On Thursday morning all the men thus taking treatment have reported with the sick and been inspected by me, and any modifications in their treatment indicated have been ordered. Three stock mixtures have been kept: one I called mist. specific, which contained 2 drachms of liq. hydrarg. perchlor. per ounce; a second, mist. alterative, containing this with 10 grains of iodide of potassium; and a third, mist. potass. iodid., containing 10 grains of this drug alone.

There has been no difficulty in carrying out this treatment in any hospital of which I have had charge. A non-commissioned officer is always on duty and can surely be trusted with the simple duty of looking up the roll and giving the man a dose of whatever mixture he requires. In large hospitals, where compounders are always on duty, the procedure is even more easily carried out. Of course, it is the duty of him who administers the medicine to see the draught swallowed before marking the patient as having attended.

With our hands strengthened by Army Order 158 of 1903, I can hardly conceive any difficulty in ensuring the taking of mercury by the mouth for the period desired by the medical officer. Has anyone experienced difficulty in carrying out the administration of quinine as a prophylactic for malaria? Why then should it be impossible to administer mercury as a prophylactic for the later manifestations of syphilis?

In writing this letter I have no intention of criticising the injection treatment. I have not sufficient experience of it to attempt this. I only wish to remove the delusion that it occupies the field to the exclusion of all other methods in Army out-patient practice. Unlike Major Porter, I think that it is as well that our young officers should know that they may prescribe mercurial pills, powders, and medicines to out-patients, and by a little arrangement can make sure that they will be taken, and that they are not confined to a method of giving mercury which, though praised almost to the extent of fanaticism by its advocates, does not seem to have commended itself to our civilian brethren as judged by the evidence in the Advisory Board Reports on Venereal Disease in the Army. The treatment of syphilis by intra-muscular injections should be considered on its own merits.

I am, &c.,
J. Ritchie,
*Major, R.A.M.C.*

*Woolwich,*
*August 22nd*, 1908.

## GUIDE TO THE OPERATIONS OF THE MEDICAL SERVICE IN THE FIELD.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—With reference to Major Porter's suggestion that some notes or books should be published as a guide to the operations of the Medical Service in the field, it may be of interest to the officers of the Corps to know that a pamphlet is about to be distributed on the subject containing a lecture by Lieutenant-Colonel W. G. Macpherson delivered at the Staff College in December last.

Lieutenant-Colonel Macpherson is also engaged in translating one of the many works that have been prepared by staff officers of Continental armies on medical tactics.

*War Office, Whitehall,*
*London, S.W.*,
*September 11th*, 1908.

I am, &c.,
J. M. Irwin,
*Lieutenant-Colonel, A.D.G., A.M.S.*

## EMPLOYMENT OF RESERVE AND DISCHARGED SOLDIERS OF THE CORPS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—Lieutenant-Colonel Bedford's appeal in last month's Journal on behalf of the Army and Navy Male Nurses' Co-operation, and the interesting account of the first annual meeting of this excellent Society, induces me to hope that some small space may be found in which to draw attention to some regulations of our own which appear to be imperfectly complied with.

The American school-boy when asked at an examination to describe the constitution of the United States replied that it was "that bit at the back of the book which nobody reads"; and I think the last four paragraphs in our Standing Orders relating to the keeping of a Corps Register are not generally known, and are certainly not generally acted on. Yet it is plainly laid down that such registers shall be kept in each district at home, and that the names, employment desired, &c., "will be sent to the Record Office in those cases where the documents, upon the soldier becoming non-effective, are not so disposed of."

I find on reference to the quarterly returns which are sent in, that 808 men have either gone to the Reserve or taken their discharge since January, 1907, while in the same period only eighty-one names, *i.e.*, 10 per cent., have been placed on our register in the Record Office, and the greater part even of these have been at the individual request of soldiers themselves after leaving the Colours, or in response to our letters. Only a day or two ago I received a letter from a man saying he had left the Colours in February last and had never been told that such a registry existed.

I suppose that hardly a day, certainly not a week, passes without applications from would-be employers being received, offering positions of different kinds, especially for trained male attendants, valet attendants, &c., and sometimes to our great regret we are compelled to reply that we have no suitable men registered, because the names are not forwarded to us by commanding officers. In such cases employers are recommended to apply to the Army and Navy Male Nurses' Co-operation, Welbeck Street, and I am delighted to see from their first annual report that they have 150 men registered. Reference is often made to our office regarding the antecedents of these applicants whilst in the Service, and the greatest care is taken to give as much assistance as possible.

I think, without encroaching on this valuable Society, or overlapping in any way, a great deal more might be done by our own officers to carry out the spirit of the King's Regulations and our own Standing Orders by forwarding to the Record Office, as a branch of the National Association for Employment of Reserve and Discharged Soldiers, the names and addresses of non-commissioned officers and men who are desirous of employment in some special corps capacity on their discharge or transfer to the Reserve. There is no question of fees or subscriptions, or deductions from salaries. It simply means a little extra trouble to the officers commanding, and a little additional interest in the men who are leaving the Colours. Now that the number authorised to extend their Colour service is strictly limited, there seems to be more reason for a word of kindly advice to men who *must* go to the Reserve. We frequently get grateful letters from men whom we have helped to obtain congenial billets, and I am quite sure that if we received more assistance from commanding officers a great many more men could be suitably placed.

I published a short account of our endeavours to obtain employment for dispensers in the Journal of March, 1906, and there seems no reason why we should not be equally successful as regards male nurses.

But it is no use sending us the names of *unqualified* men. The applications we receive are first for nurses, valet-attendants, &c., secondly for dispensers at home and abroad, sometimes for clerks or medical storekeepers, and occasionally for cooks and caretakers. The unqualified man had better be directed to the Depôt Barracks or Recruiting Staff Officer nearest his intended place of residence, and Army Form B 2088 made out for him, instead of, as is frequently the case, leaving it to be called for and made out by us, which involves a delay and consequent loss of wages to the applicant.

I should like to add one word on the importance of keeping a *local* register. Where do the principal medical officers expect to get their pensioners and trained ex-soldiers to fill the responsible positions in their hospitals if ever mobilisation is ordered again, and the Corps embarks for active service with its Reserves?

The Royal Army Medical Corps Militia has vanished, and though the home Hospitals Reserve of the St. John Ambulance Brigade will, no doubt, be a valuable asset, the men must be trained, and the employment of steady pensioners or ex-soldiers as dispensers, stewards, or wardmasters will be of the utmost importance.

Mobilisation instructions for the Army Medical Service says (p. 5) that N.C.O.'s and men available for duty in coast defences, &c., will be obtained from the following sources: (*e*) "Employment of pensioners and ex-soldiers." Are these names registered in case of need?

I am, &c.,

E. M. Wilson,

*Lieutenant-Colonel R.A.M.C. (R.P.)*

*Belmont, South Farnborough,*

*September 12th*, 1908.

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## Original Communications.

# THE SOLAR ELEMENT IN SUNSTROKE, IN ITS PHYSICAL RELATIONS.

By Lieutenant-Colonel R. J. S. SIMPSON, C.M.G.
*Royal Army Medical Corps.*

THAT "sunstroke" is due to the definite influence of some element of the solar radiation, probably other than heat-rays, is a theory which has been advocated by many writers. The evidence is not always as strong as the language in which the theory is expressed; indeed, some of the evidence that is adduced in support shows a forgetfulness of the physical conditions which exist. These conditions can be stated comparatively briefly if the statement is general and does not include a criticism of the evidence, which would require much space.

## I.

Three factors are involved, the radiant, the recipient, and the intervening medium, the atmosphere.

(1) Variations which may occur in the intensity or composition of the radiation from the sun are negligible in this connection, as they affect the whole of the surface of the earth on which the sun shines each day; hence it is only those variations of lesser period than the earth's revolution which can have any differential action within that time. Further, so far little is known of the variations of this type.

(2) Now suppose, what is probably the case, that the atmosphere forms a shell of equal thickness round the earth, whose bounding

surface forms a sphere concentric with the earth, then the quantity of the solar radiation received by any unit area of that surface depends solely on the altitude of the sun at that place: all portions of the atmospheric sphere having the same latitude receive identical amounts in succession; all portions on the same meridian receive different amounts at the same moment.

(3) Absorption of the solar radiation takes place in the atmosphere; this absorption varies in two ways: (*a*) Secular absorption, depending on the thickness of the atmosphere traversed, which depends on the altitude of the sun; the greater the altitude the less the thickness. This increases the differences already noted as due to altitude alone, which, of course, occur hourly and daily throughout the year. Up to this point we have general conditions which depend on purely geometrical considerations. In (*b*), Specific absorption in the atmosphere, we obtain the explanation of differences between localities having the same latitude, and between seasons and times of the day in regard to the spectral composition of the radiations received by the earth. Two cases exist: (*a*) where the absorption is the same throughout the whole range of the spectrum; and (*b*) selective absorption, where one portion of the spectrum is absorbed to a greater extent than the remainder. Where the absorption is the same throughout the whole spectrum the only result is the diminution of the intensity of the whole of radiations received; this case is extremely difficult to realise in practice, if the whole spectrum, visible and invisible, be concerned.

The more important case is the second, where the coefficient of absorption varies throughout the spectrum; this results in a change in composition of the radiations transmitted, manifest in the visible spectrum by a change of colour, the medium then assuming the colour which is the resultant of the rays transmitted. Ordinary glass absorbs some proportion of the rays at both ends of the spectrum, the infra-red and the ultra-violet, leaving the visible spectrum unchanged. The absorption depends on the thickness of the absorbing medium in a very simple way; if a layer of the medium of unit thickness absorbs, say, 10 per cent. of the incident rays, it transmits 90 per cent. A second layer of unit thickness will then absorb 10 per cent. of the 90 per cent. transmitted by the first layer, or two layers will transmit 81 per cent., and so on in diminishing quantity in proportion to the square of the number of the layers of unit thickness. Hence, if the absorption coefficients of two portions of the spectrum are unequal, the difference in the composition of the transmitted light increases more rapidly than the thickness of the medium. Hence the phenomenon of dichroism.

If one takes a medium which is homogeneous in the sense that unit volumes from different parts have the same composition, but which is at the same time particulate, in that it contains fine particles suspended at sensible distances apart in some more transparent medium, one finds that there is a relation between the size of the particles and the wave-length of the rays absorbed (or more exactly, dispersed at an angle to the path of the incident ray), that the larger the particles the greater the wave-lengths which are absorbed. This can be shown by an easy and elegant experiment, and too familiar examples of the same action are seen in the reddening of the disc of the sun when it happens to be visible in a fog, in the dust-laden atmosphere in India, South and West Africa, and elsewhere.

It is quite possible that, even in the case of media which appear to be perfectly homogeneous in the stricter sense of the term, selective absorption, that is colour, is really dependent on the presence of small particles in a transparent medium; some observations with the ultramicroscope support this view. But it is the absorption due to dispersion by particulate matter that is important in this special case of the radiations received by the earth. Ice crystals, globules of water, larger or smaller, with or without a nucleus of solid matter, particles of carbon, fine mineral matter, as in the classical case of the eruption of Krakatau, or raised by the wind as dust, all these are the cause of an alteration in the composition of the transmitted radiations and of their intensity when they reach the earth.

(4) The conclusion from these data is then that, whether the whole of the elements of the solar radiation have been recognised or not, the spectral composition of the radiations received at any one place depends solely on the atmospheric absorption at that place. Nothing can be added to the solar radiation which is not present at its source; the atmosphere is a radiant body only in the same sense as the earth, sending out heat-rays of comparatively long wave-lengths. Greater transparency of the atmosphere at one place than at another is the only possible means by which any variation in the composition of the radiations transmitted can occur.

## II.

The older division of the spectrum was into heat, light, and chemical rays. It is better to say that the waves of greater length produce most heat; the shortest, most chemical action; and those between, the greatest sensation of light. But part of the energy of every part of the spectrum is degraded into heat when the waves are absorbed; every part, even the infra-red, is capable of producing chemical action, and it is quite possible that the eyes of certain animals give rise to a sensation of light with rays outside the range visible to man, as it is of course the case that the extent of the visible spectrum varies between individuals. Hence there is no sharp line of demarcation between these three groups.

The total heat energy of the spectrum is supposed to be integrated by some such instrument as the solar radiation thermometer. This is a rough measure of the total heat energy received; it bears, of course, no constant relation to the temperature of the place of observation, which is so extensively influenced by local conditions. The difference between the solar radiation thermometer and the shade temperature gives a measure of the heating effect of the sun. "In India[1] this difference is as a rule from 50° to 70° F. It does not vary much in the course of the year so long as the sky is unclouded; but it is higher at hill stations than on the plains, in the cold weather considerably higher." In 1885, "by no means a hot year," in Murree, this difference varied from 68° F. in October to 92° (?) in February; in Simla, from 69° in August to 84° in February; in Lahore, from 60° in November to 79° in March and April; in Calcutta, from 62° in April to 71° in June and July; and in Madras, from 53° in June to 65° in September and December. In the Army Medical Department Report for 1898, p. 527, the differences for thirteen months in Maritzburg are charted out for five-day periods, and show considerable and rapid variations.

Instead, however, of considering this difference as a measure of the heating effect of the sun, we may consider it as a measure of the atmospheric absorption. We then come to the question whether we can assume that the other effects of the radiation are proportional to the heating effect recorded by the solar radiation thermometer, whether the shorter waves are present in the same proportion as the longer. We know that this is not always the case; the red sun in fog or dust shows the elimination of the shorter waves. Therefore, although for the most part, there is no great error in assuming that a smaller difference between the solar radiation thermometer and the shade temperature means increased atmospheric absorption throughout the whole spectrum, but unequally, for the most part direct observation is necessary for the measurement of what are conveniently called actinic rays, that is, those which are chemically most active.

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[1] Blanford, "Climates and Weather of India,"

There appears to be no simple but accurate method of observation. Methods depending on chemical reactions (the amount of the change being measured by titration) have been used by Bunsen, Roscoe, and others; these require some kind of a laboratory, in addition to fragile and somewhat complex apparatus. Hurter and Driffield used a kind of differential thermometer of which one bulb was made of red glass. Their observations, extending over a year, were carried out in England, with the object of getting some accurate indication of the exposures needed in photography. They found that there was a definite relation between the intensity of the northern sky light and the altitude of the sun, and that the influence of atmospheric conditions could be allowed for by grouping these conditions in five easily defined grades, which were (1) bright sunlight, (2) sun shining through light clouds, (3) diffused light, (4) dull, (5) very dull; and that a definite numerical relationship existed between the intensity of the light under each of the conditions. The results of their research were embodied in the actinograph, a calculating machine for the practical use of photographers, which has in practice been entirely successful in every part of the globe. Later the same principle has been adopted in other and simpler forms of calculators, and the practical result is that innumerable photographs are taken all over the globe where the exposure is calculated by this system, and proves to be "correct": that is, within the limits of variation of the sensitive surface.

This system, then, gives an approximation to the true measure of the rays which are photographically active, and it is therefore useful to consider what the amount of variation is that is found to be of practical importance in photography. The difference for latitude, including normal atmospheric absorption, is found to be small for the same hour of the day according to local time. The latitude of 30° is the dividing line about which the variation is of practical importance, or at least merits recognition, and if we take midday (the period of maximum altitude of the sun), for some considerable breadth outside this line, as compared with the area between it and the equator, the variation according to one set of tables is as 4 : 3, according to another set, as 3 : 2. At other times of the day the difference is, of course, greater. This difference, due to latitude, is much less than that due to atmospheric conditions, where the photographically active light in bright sunlight is, according to Hurter and Driffield, four to six times as intense as that in "very dull" weather. These measurements are only approximate, but they are sufficiently accurate for practical work with light sensitive media, and it has to be noted that the results are obtained on surfaces of much greater sensitiveness than any of the tissues of the body can be, protected as they are by a layer containing a strongly absorbing medium, hæmoglobin.

We have, then, a rough measure of the heating effect of the radiations by the solar radiation thermometer, and some indication of the photographic activity of the light in various places; we have to consider how far these are trustworthy. There is no doubt that the solar radiation thermometer requires great care in use, that its errors are often large and not always to be estimated and allowed for. Six thermometers of the same make, giving identical readings in the shade, and exposed together to the sun, will give results differing by some degrees. Now if this is the case with carefully-made instruments, of identical construction, what reliance can be placed on observations of the protective value of different kinds of cloth under which different thermometers, possibly not all of the same pattern, are exposed? The cases are analogous, and the recorded differences in temperature below the different stuffs are not greater, and may be less, than those between different solar radiation thermometers, in which, too, the disturbing effect of convection currents do not at least reach the bulb. Observations of the effect of radiant heat in closed vessels are, of course, of a different type, but the experiments which are so often made appear to be affected by large errors, and the results are of little or no value unless full details of the mode of exposure are given.

Again, we have photographic observations of two types: (1) In the camera; (2) the exposure of sensitive material.

In using these methods, we assume that the curve of sensitiveness of the part of the body affected is the same as that of the sensitive material used within the limits of error; this is probably justifiable.

(1) *In the Camera.*—This method is full of pitfalls, but, instead of detailing these, it is simpler to indicate the conditions which are necessary to obtain anything like accurate results.

Seven conditions must be invariable: (*a*) The aperture of the lens, except in first-class instruments; (*b*) the time of exposure, or time-aperture where the aperture is varied; (*c*) the plate; (*d*) the developer; (*e*) the temperature of development; (*f*) the time of development; (*g*) the subject.

(*a*) With one and the same lens, this is easily attained; it must be small enough to allow of (*b*) the exposure being easily timed by a watch, probably not less than five seconds; shutter exposures are absolutely untrustworthy for this purpose. (*c*) This is the first important source of error, in that the plate (especially in the slower grades which are almost necessary for keeping quality and to permit of a sufficiently long exposure) possesses a "latitude" which allows of variations in exposure of about 400 per cent. under normal development, with identical results as regards the print. The remedy is to take the density of the negative, and not the gradation of the print, as the criterion. A source of error which cannot be entirely eliminated is the variation in the speed of the plate, even where they are all of the same batch of emulsion, while most plates alter their speed after keeping for a time. This variation may mount to an important quantity. For serious observations of this type a sufficient quantity should be ordered, all to be of the same batch of emulsion, and each packet should be enclosed in a soldered tin case. (*d*, *e*, and *f*) require no comment; any good commercial developer used at constant temperature for constant time will suffice. (*g*) The best subject is an evenly illuminated sheet of white paper, the exposure being made through a graduated screen placed immediately in front of the plate; this allows of identical conditions being reproduced. The only natural subject which can be used is an open landscape in which there are no dark shadows, because the shadows are illuminated by sky light, and up to a certain point, the more atmospheric absorption, the more light in the shadows.

It will be seen that the casual snapshot, as casually developed under uncertain conditions, can rarely, if ever, be of any value as a record of actinic intensity.

(2) *The Exposure of Sensitive Material for a Measured Time.*—Here not so many difficulties occur, but one in particular, which is the keeping quality of the material used. Two methods may be used: (*a*) the matching of a tint; and (*b*) the exposure under a graduated screen. The first method is probably the most accurate, as with practice the end point is sharper than in the second method; it is the method used in the Watkins and the Wynne exposure meters, which have been found to give very

satisfactory results in practice. Both instruments require special paper, and this does not yet appear to be entirely trustworthy under trying climatic conditions, especially extreme degrees of humidity. This difficulty might be got over by special methods of storage. Exposure under a graduated scale (such as in Wynne's print meter) is closer in gradation, but, partly for this reason, more difficult to read. It has the advantage that no special paper is needed; any good P.O.P. is satisfactory, and this apparently keeps well, and the same brand is fairly constant in sensitiveness. Either method will give good results under ordinary conditions, and if the slips or discs of paper used are kept protected from light, a fairly permanent record remains of the observations.

The curves of these three sensitive materials, plates, special papers, and P.O.P., do not correspond accurately, but the difference is not of practical importance in photography, and is hence probably entirely negligible in this special relation to sunstroke.

There remain to be considered those wave-lengths which produce the sensation of light. Their measurement is important from the general aspect, and in particular in view of the increased comfort, if not protection, afforded by smoked or blue glasses. Most smoked glasses have, in fact, a faint yellowish tinge; there is therefore some absorption of the shorter wave-lengths as well as a general dimming of the whole spectrum; in blue glasses the same general absorption does not take place. Recently orange-tinted and yellow or "amethyst"[1] glasses have been placed on the market, which are said to be as effective as the smoked glasses. It is, of course, quite obvious that the same theory cannot explain the beneficial results from the use of blue and of orange glasses, unless we assume that the effect in each case is purely mental. There is, however, no doubt that in a brilliant light the smoked glass is by far the most effective, and this must be due to the reduction in intensity of the whole spectrum, except possibly the longer wave-lengths.

Photometric observations of the luminous intensity of sunlight are obviously impossible without a well-equipped physical laboratory. There is a method by which it is possible some indication of the variations might be obtained, where the observer uses his own retina as the sensitive medium, and his pupil as the indicator. This method has indeed been proposed by a Norwegian inventor who has patented a device (in which the observer sees the image of his own pupil projected on a scale) for practical use in determining photographic exposures. Unfortunately, it does not appear to be on the market, and there appears to be little probability of its being taken up. It is, of course, quite easy to construct an instrument which will give the necessary measurement of the pupil, within a certain range, but it is probable that with higher intensities of illumination the differences between them would not produce measurable differences in the pupil diameter, even if they were in direct relation to the differences in the stimuli; on the other hand, if Fechner's law holds good, as appears to be the case from some series of observations, the pupil differences would be much smaller than the light differences. There is, further, the difficulty that the sensitiveness of the retina varies from time to time, but here probably a differential observation would give better results. It would appear to be useful to undertake a series of observations of this type.

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[1] "Amethyst" is a trade name; the colour is really a bright orange. The latest is a greenish yellow, the so-called "chlorophyll" glass.

So far, the rays incident on the body have been considered apart from the body-covering, except as regards its colour. But the body-covering is also of considerable importance in relation to the quantity of the radiations absorbed on the one hand, and transmitted or radiated on the other. This is a large question on which a good deal has been written, and which need not be considered at this time.

It is not desirable to formulate any definite conclusion without reviewing the evidence, but it appears to be permissible to point out that if differences in the intensity of the actinic radiations are effective in producing sunstroke in one place rather than in another, as these differences are small, the tissues of the body which are affected by these radiations must have a degree of sensitiveness which is comparable with that of a rapid plate, and probably a colour-sensitive plate, in view of the specific absorption of the hæmoglobin which permeates the whole of the tissues. Where there is any staining of the tissues, as in jaundice, chronic malaria and the like, there must be an additional absorption of the shorter wave-lengths and a lessened sensitiveness to sunlight. It is difficult to believe that this degree of sensitiveness can exist.

# ON THE USE OF LACTO-SERA AS A MEANS OF DISTINGUISHING GOAT'S MILK FROM COW'S MILK.

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After I had isolated *Micrococcus melitensis* from goat's milk, specimens of cow's milk were frequently brought to the laboratory for examination as to adulteration with goat's milk. As cow's milk in Gibraltar costs far more than goat's milk, there is always a tendency for the milk vendor to add the latter to the former and then sell the mixture as pure cow's milk. The fraud is very difficult to detect by physical or chemical examination, so I turned my attention to the lacto-sera in the hope that they might enable the adulteration to be detected in a few minutes.

Bordet[1] first showed that if a rabbit were injected intra-peritoneally with milk previously heated for one hour at 65° C., after a certain time a serum would be obtained having special properties in relation to the milk. He placed 3 cc. of the active serum in a test-tube, and 3 cc. of normal serum obtained from different sources in a series of test-tubes, and then added ten to twelve drops of the milk to each tube. In the tube containing the active serum granules rapidly appeared, which increased in size and formed thick flakes. Very soon the contents of the tube separated into two parts, one clear and the other containing agglomerated flakes. Sometimes the flakes descended to the bottom of the tube and the upper part cleared. This happened when the milk was poor in fat, or had been filtered two or three times through paper. If the milk were rich in fat the flakes were carried to the upper part of the tube through the agency of the fat globules enclosed in them. Under the microscope the mixtures of milk and active sera showed very numerous clumps of granules, which were not found in the mixtures of normal serum and milk. Wassermann and Schütze[2] injected rabbits subcutaneously with goat's, cow's, and ass's milk, and claimed that the active serum produced by each milk was specific, viz.: that each serum would only produce a præcipitum with the milk that had been used to prepare it. Schütze also stated that boiling milk interfered with the production of the specific reaction.

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[1] "Le Mécanisme de l'Agglutination," *Annales de l'Institut Pasteur*, 1899, p. 225.

[2] "Neue Beiträge zur Kenntniss der Eiweissstoffe verschiedener Milcharten;" *Verein f. innere Med.*, Berlin, July 2nd, 1900.

The following experiments were made with the object of confirming and extending these observations:—

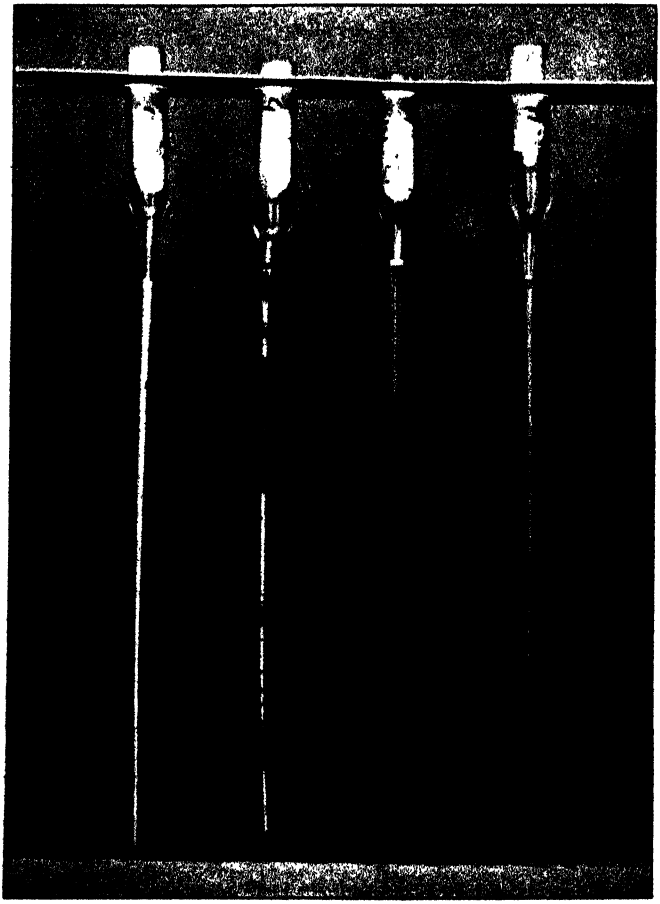
## TO DETERMINE THE SPECIFICITY OF LACTO-SERA.

### GOAT'S MILK.

*Experiment I.*—A rabbit was injected intra-peritoneally on May 2nd, 6th, and 11th, 1907, with goat's milk previously heated at 60° C. for half an hour. On May 15th, 22nd, and 28th, 10 cc. of milk were given, and on June 15th 15 cc.; the rabbit receiving altogether 65 cc. of goat's milk. Blood was then removed from an auricular vein and 3 cc. of the serum were placed in each of four small test-tubes. Goat's milk was now added to the first tube, cow's milk to the second, human milk to the third, and ass's milk to the fourth tube. As a control, a like amount of normal serum was placed in a fifth tube, and goat's milk was added to it. In half an hour the tube containing goat's milk and goat's serum showed granular masses surrounded by a clear fluid, and at the end of four hours most of the granular masses had floated to the surface, and the fluid in the tube was uniformly clear. The tubes containing the cow's milk, ass's milk, and human milk showed no change in half an hour; in four hours some of the fat floated to the surface, but the fluid below was uniformly opaque. The tube containing the goat's milk and normal serum was unchanged at the end of half an hour; in four hours, however, some of the fat floated to the surface, but the fluid below still remained thick and opaque.

The procedure above described necessitated the use of a considerable quantity of serum for each test. In order to economise the serum the following method was tried:—The milk to be tested was diluted, 1—5, with normal salt solution, and a portion was then drawn up in a capillary pipette and the upper limit marked off. The diluted milk was next blown out into a watch-glass, and active serum was drawn up to the mark on the pipette; the serum and diluted milk were then thoroughly mixed, and the resulting mixture was finally drawn up in the pipette and the end sealed off. As a control, the same procedure was followed with the diluted milk and normal rabbit serum. Some of the diluted milk was also drawn up in a capillary pipette and sealed off. Every endeavour was made to keep the columns of fluid in the control pipettes the same as in the pipettes containing the active serum. In the control pipettes no changes were seen, except that after a few hours some of the fat floated to the top of the tube; this was especially noticeable in the case of cow's milk. In the pipettes containing the active serum and goat's milk there appeared after about two minutes white flocculi, which gradually increased in size and density, the fluid between them becoming clear and transparent. The results are well shown in photograph I.

PHOTOGRAPH I.



Goat's milk diluted with normal saline solution (1-5).

Diluted goat's milk + goat's lacto-serum, equal parts.

Diluted goat's milk + normal rabbit's serum, equal parts.

Diluted cow's milk + goat's lacto-serum, equal parts.

In addition to the pipettes, hanging drops were prepared with the mixtures of milk and active and normal sera. Under $\frac{1}{6}$ inch objective the mixture of normal serum and goat's milk showed a fluid containing fat globules evenly distributed throughout the preparation, but in the case of the mixture of goat's milk and active serum clumps of granules mixed with fat globules were noticed in about two minutes, and between the clumps the fluid was clear and transparent.

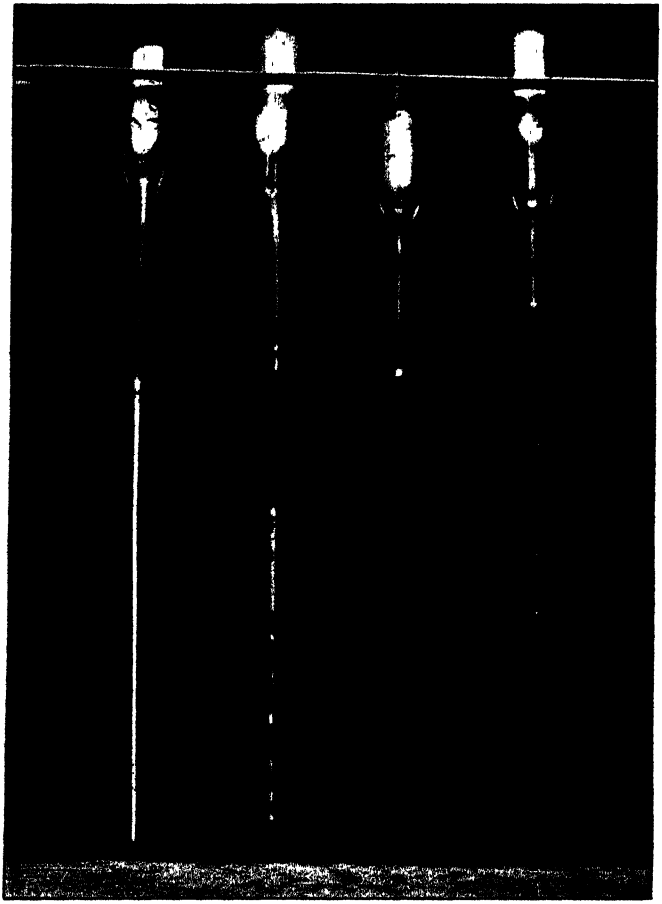
*Experiments II. and III.*—These were a repetition of Experiment I., and similar results were obtained, the formation of flocculi in the capillary tubes containing the active serum and goat's milk being practically instantaneous. The serum of three rabbits was also diluted 1—5, and then mixed with an equal volume of goat's milk diluted 1—5. Nothing was seen in the capillary tubes for three hours, when fine flocculi appeared, and at the end of twenty-four hours thick, white masses, separated by clear fluid, were seen scattered through the tubes.

*Experiment IV.*—In the hope of preparing a serum which, when diluted 1—5, would act practically instantaneously, it was determined to inject larger quantities of milk, using the subcutaneous instead of the intra-peritoneal method. Accordingly 165 cc. of goat's milk were injected into a full-grown rabbit, 15 cc. being given on September 19th, 21st, 23rd, 25th, and 27th, 1907, and 30 cc. on September 30th, October 2nd and 4th. On October 7th the serum was tested by the capillary pipette and hanging drop methods, and practically an instantaneous reaction was obtained with the goat's milk when the serum was undiluted. It was noticed, however, that when the serum undiluted was added to diluted cow's milk, flocculi began to appear in the capillary tube after a short time, and in about two hours the appearance of the tube corresponded very closely to that of the pipette containing the goat's milk. Under ½ in. objective, granular masses mixed with fat globules were seen in the mixture of both goat's milk and cow's milk with active serum, but in the case of the latter the clumps were distinctly smaller. Cow's milk, precipitated by the goat's lacto-serum, is well shown in photograph II.

The active serum was then diluted 1—5, and mixed with equal volumes of goat's milk and cow's milk, the dilution of the serum in the pipette being in each case 1—10. At the end of five minutes flocculi were distinctly visible in the pipette containing the goat's milk, and under $\frac{1}{6}$ in. objective granular masses mixed with fat globules were seen scattered throughout the field. The tube containing the cow's milk remained uniformly opaque, but after some hours a layer of fat floated to the top of the tube, and when the fluid was examined in a hanging drop some grouping of the fat cells was observed, but no granular masses ever appeared.

This experiment seemed to indicate that when large quantities of goat's milk were injected the precipitating anti-serum produced acted as a group precipitant, and to distinguish between goat's milk and cow's milk it would be necessary to dilute the anti-serum.

PHOTOGRAPH II.



Goat's milk diluted with normal saline solution (1-5).

Diluted goat's milk + goat's lacto-serum, equal parts.

Diluted goat's milk + normal rabbit's serum, equal parts.

Diluted cow's milk + goat's lacto-serum, equal parts.

*Experiment V.*—In this experiment smaller quantities of goat's milk were injected subcutaneously, 10 cc. being given on February 3rd, 5th, 7th, 1908, and 15 cc. on February 10th and 13th. The serum tested on February 16th was again found to precipitate both goat's milk and cow's milk; but on diluting it 1—10, as in the above experiment, a reaction did not appear in the pipette containing the cow's milk, and an examination of the contents in a hanging drop also proved negative.

*Experiment VI.*—This was a repetition of Experiment V., but a larger rabbit was taken and the injections were separated by longer intervals. The milk was heated at 60° C. for one hour and 10 cc. were injected on April 16th and 24th, May 5th, 8th, and 13th, 1908. The serum was examined on May 16th and found to react only with goat's milk.

In order to determine the length of time that the anti-bodies persisted in the serum, the lacto-sera obtained in the various experiments were placed in capillary pipettes and kept in the dark. The sera were examined weekly, and it was found that the reaction gradually became more and more feeble, requiring a longer time to produce a precipitate on each occasion. At the end of two months, as a rule, twenty-four hours were required to produce a complete reaction. Similar results were obtained with the sera removed at each test from the rabbits, which had received no further injections after the production of the anti-bodies.

The rabbit in Experiment VI., after the development of the specific reaction, received a weekly injection of 10 cc. of goat's milk. The result was not altogether satisfactory; in the third month after the commencement of the experiment the formation of precipitates was very irregular.

In order to obtain the best results, a fresh rabbit should be injected every month.

## COW'S MILK.

*Experiment I.*—Cow's milk, previously heated at 60° C. for half an hour, was injected as follows:—15 cc. on July 13th, 17th, 22nd, 26th, and 31st, August 3rd, 7th, and 10th, 1907; 120 cc. being given. On August 12th the serum was tested by the capillary tube method; clumps were seen in fifteen minutes in the tube containing cow's milk, but the goat's milk gave no reaction. On August 22nd the serum was tested again, and clumps were formed practically at once with the cow's milk, the goat's milk again giving negative results.

*Experiment II.*—In this experiment the heated milk was injected subcutaneously, 190 cc. being injected in twenty-two days. The injections were given as follows:—30 cc. on November 11th and 15th, 25 cc. on November 20th and 22nd, 30 cc. on November 25th, and 25 cc. on November 28th and December 2nd, 1907.

The serum was tested on December 3rd, and an instantaneous reaction was obtained both in the capillary tube and hanging drop. No reaction was given with either goat's or human milk. The serum diluted 1—10 gave a slight reaction with cow's milk in the capillary tube after one hour, but no granular masses were observed in the hanging drop after twenty-four hours.

*Experiment III.*—Only 140 cc. were injected, 20 cc. being given on the following dates:—December 13th, 16th, 20th, 23rd, 27th, 30th, 1907, and January 2nd, 1908. Serum was taken on January 3rd, 1908, and tested with goat's, cow's, and human milk. As in the previous experiment, an instantaneous reaction was obtained with cow's milk in both the capillary tube and hanging drop. In the tube containing goat's milk a few clumps were seen, and after one hour granular masses were observed in the hanging drop. No reactions were seen in the pipette and hanging drop containing human milk. The serum was tested again on January 8th, 1908, but no reaction with goat's milk was then obtained. Examinations made at later dates also proved negative as regards goat's milk.

*Ezperiment IV.*—In this experiment 60 cc. of milk were injected subcutaneously, 10 cc. being given on the following dates:—April 16th, 24th, May 1st, 5th, 8th, and 13th, 1908. The serum was tested on May 16th, when a complete reaction was obtained with cow's milk at the end of two hours; but with goat's milk and ass's milk no reaction was observed even at the end of twenty-four hours.

## HUMAN MILK.

Human milk was obtained from a British subject born in Gibraltar, and a chemical analysis of it corresponded very closely with that given in most text-books. The chief characteristics were the large amount of milk sugar and the small quantity of proteids present. The milk was heated at 60° C. for half an hour, and 20 cc. were injected subcutaneously on the following dates:—December 11th, 13th, 16th, 20th, 23rd, 27th, 30th, 1907, and January 2nd, 1908. The serum was tested on January 3rd, when clumps were seen in the pipette containing human milk in about five minutes; in one hour the clumps were large, and the fluid in the tube was quite clear. Granular masses were not seen in the hanging drop at first, but after one hour they were quite distinct. The pipettes containing goat's milk and cow's milk and the active serum, gave negative results even at the end of twenty-four hours.

### Ass's Milk.

The milk was heated at 60° C. for half an hour on each occasion, and 10 cc. were injected subcutaneously on the following dates:—April 24th, May 1st, 5th, 8th and 13th, 1908. On May 16th, 1908, the serum was examined by the pipette and hanging drop methods, the milk being diluted, 1—4, with normal salt solution. At the end of two hours precipitated masses were seen in the tube, the fluid being quite clear between them, and granular masses mixed with fat globules were observed in the hanging drop. No reaction was obtained with either goat's or cow's milk.

*Conclusions.*—(1) It would appear that if goat's milk is injected into a rabbit in considerable quantities and at frequent intervals the lacto-serum obtained will precipitate the casein of cow's milk as well as that of goat's milk. Under these conditions it is necessary to dilute the lacto-serum 1—10, in order to demonstrate the specific reaction. (2) As a rule, when quantities not exceeding 10 cc. are injected either intra-peritoneally or subcutaneously at intervals of about seven days, the lacto-sera obtained are specific.

### To Determine what Amount of Goat's Milk added to Cow's Milk can be Detected by the Lacto-Serum.

Equal parts of goat's and cow's milk were thoroughly mixed, and a dilution (1—4) of the mixture was then added to an equal volume of goat's lacto-serum. Precipitated masses were at once seen in the capillary tube, and granular masses were observed in a hanging drop (see Photograph III.).

One part of goat's milk was now added to three parts of cow's milk, and the mixture examined in a similar manner. Precipitated masses were seen in two hours, but the reaction was not perfectly complete: viz., the fluid was not quite transparent between the masses until the end of twenty-four hours.

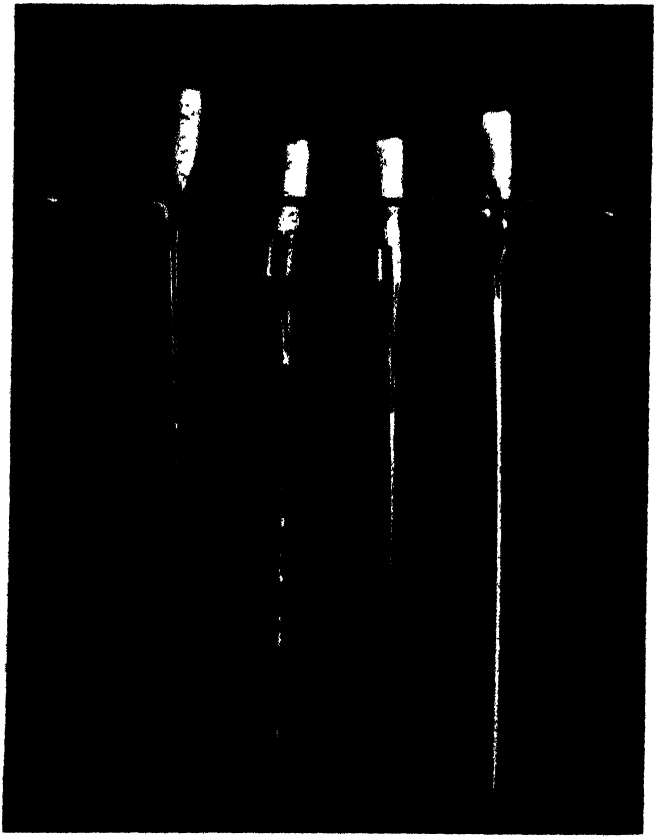
One part of goat's milk added to nine of cow's milk, when tested with the lacto-serum, could only be detected after the lapse of twenty-four hours; the precipitated masses were then small, and the fluid remained opaque between them.

Practically, it is unlikely that the milk vendor will add less than one part of goat's milk to three parts of cow's milk, as smaller quantities would not pay him. Such an addition can be detected in two hours with an active goat's lacto-serum.

## THE EFFECT OF HEAT APPLIED TO THE MILK AND THE ANTI-SERUM.

Schütze stated that milk which had been boiled for half an hour lost the greater part of its power to form a precipitate on the addition of its specific lacto-serum. The goat's and cow's lacto-sera, which had been found to produce precipitates with the unboiled milks used to prepare them, were tested again with samples boiled

PHOTOGRAPH III.



Mixture of equal parts of cow's and goat's milk diluted 1-5 + goat's lacto-serum.

Diluted goat's milk + goat's lacto-serum.

Diluted cow's milk + goat's lacto-serum.

Diluted mixture of cow's and goat's milk + normal rabbit serum.

down to half bulk, and precipitates were obtained both in the hanging drop and capillary tube.

A rabbit was next injected intra-peritoneally with goat's milk which had been maintained at the boiling point for one hour. On each occasion 10 cc. were given, and the injections were made on June 11th, 14th, 19th, 22nd, 24th and 28th, 1907. The serum was tested on June 29th, and found to produce an immediate precipitate with goat's milk heated at 60° C. for half an hour, and also when boiled down to half bulk.

It would therefore appear that boiling goat's milk does not interfere either with the production of a lacto-serum or with the formation of a precipitate by the specific lacto-serum. This point is of importance, as by law goat's milk cannot now be sold in Gibraltar unless it has been boiled.

The effect of heat on the lacto-serum was next investigated. The specific serum was drawn up in a sterile capillary pipette, and then maintained in a water-bath at a temperature of 60° C. for half an hour. After this treatment the serum was found to produce a precipitate indistinguishable from that given by the unheated serum. Heating this serum, however, at 65° C. for half an hour, or at 60° C. for two hours, destroyed its specific properties, no reaction being obtained even after twenty-four hours.

*Conclusions.*—(1) Boiling goat's milk for one hour does not interfere either with the production of a lacto-serum or with the formation of a precipitate by the specific serum. (2) Heating the lacto-serum at 60° C. for two hours or at 65° C. for half an hour destroys its specific properties.

## TO DETERMINE WHETHER THE INJECTION OF AN EMULSION OF UDDER-CELLS WILL PRODUCE AN ANTI-SERUM.

"Fisch found that an emulsion of udder-cells, injected into animals, gave the same results as when milk was injected."[1] In order to determine whether injection of udder-cells instead of goat's milk would give a more powerful lacto-serum, the udder from a Maltese goat in full milk was removed with all precautions, and a portion about the size of a walnut placed in each of a series of sterile test-tubes, which were then plugged with cotton-wool. The test-tubes were kept in the cool incubator at a temperature of 20° C. until required for use. For each injection the portion of the mamma in a test-tube was carefully pressed so as to remove all milk from the tubules, and was then placed in a sterile mortar containing 10 cc. of sterile normal salt solution and worked up with a pestle until all the glandular tissue was removed and only shreds of fibrous tissue remained. The opalescent solution thus obtained was drawn up in a sterile syringe and injected intra-peritoneally into a medium-sized rabbit. Injections were given on June 27th, July 2nd, 5th and 9th, 1907. Blood was then removed and the serum tested, in the usual manner, with goat's milk. No reaction was obtained in either the capillary tube or hanging drop. Injections were repeated on July 27th, August 3rd and 7th, 1907. On August 10th the serum was again tested, and distinct clumps were seen in the capillary tube. Five days later the clumps were much larger, but they were still small when compared with those obtained by employing the anti-serum produced after injections of goat's milk. Tested a fortnight later, only a slight reaction was obtained, and a month after the last injection the anti-bodies seemed to have disappeared from the serum.

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[1] Nuttall, *Journal of Hygiene*, vol. i., 1901, p. 369.

*Conclusion.*—The injection of an emulsion of udder-cells into a rabbit produces anti-bodies, but these rapidly disappear from the serum.

# THE TREATMENT OF GONORRHŒA IN THE ARMY.

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The important question of the treatment of gonorrhœa in the Army, from an efficiency point of view, is at the present time even more pressing than that of syphilis, owing to the larger number of cases of gonorrhœa as well as to the longer stay in hospital. Syphilis is now, as the result of systematised out-patient attendance and other factors, fairly well under control in large military stations (*vide* Appendices 1, 2). Appendix 1 shows the number of cases of gonorrhœa admitted to the Royal Herbert Hospital, Woolwich, in the five years 1903 to 1907 inclusive; and it will be observed that there is a marked reduction in the numbers in recent years. This is largely due to a considerably reduced number of admissions from relapse of gonorrhœa, as the result of more prolonged and thorough treatment in hospital in the early stages, and to later out-patient inspection. These factors are necessarily inter-dependent, and as the result of their application there is after a time, when control has been carefully exercised, a great diminution, not only of relapse of gonorrhœa but of venereal disease generally within a garrison. Further, the fact that the women in the neighbourhood are not so quickly infected or re-infected by diseased or partially treated soldiers, especially gonorrhœal cases, still further tends to a beneficial result, since a diseased woman commonly associates not only with an individual soldier, but also with his comrades. A certain class of soldier, it is well recognised, contracts fresh venereal disease over and over again, as a close examination of Medical History or Syphilis Case Sheets will soon reveal; and special provision should be made for these men.

Acting on the experience suggested by the study of syphilis whilst at Woolwich in the years 1905 to 1908, in a garrison of some 5,000 troops, I have exercised since July, 1907, a more systematic control over gonorrhœal patients, and supervised them for a month on discharge from hospital, with the result that whereas in the year 1907 there were 195 cases of gonorrhœa with 2 cases of relapse, yet in the last three months of 1907 there were only 37 cases of gonorrhœa with no cases of relapse amongst the local troops, and only 24 cases admitted during the first three months of 1908 with no relapse. (*Vide* Appendix 7.)

On September 17th, 1907, the Guards' Hospital at Rochester Row, London, was closed, and all the gonorrhœal patients from the London garrison (4,000 strong) were sent to Woolwich. From September 17th, 1907, to December 31st, 1907, 185 cases of gonorrhœa were sent for in-patient treatment. In the period January 1st, 1908, to March 31st, 1908, only 94 cases were sent (none being admitted in London). In dealing with London troops, however, I was unable to arrange in the case of gonorrhœal patients for the scheme in existence at Woolwich to be carried out; there were, consequently, numerous relapse cases, namely, 22 in the period September 17th to December 31st, 1907, 8 being transferred on September 17th, 1907, when the hospital in London was closed, and 22 in the period January 1st to March 31st, 1908. This is explained later in dealing with relapses, and was commonly due to hard military exercise immediately on discharge from hospital. The cases are given in Appendix 7. Out-patient supervision, besides minimising the number of re-admissions for relapse, naturally tends to reduce the frequency of intractable gonorrhœal complications, such as stricture, arthritis, and orchitis, which necessitate hospital treatment for several months, and commonly lead to invaliding, either as the direct result of the complication itself or of other diseases indirectly arising from it.

As it is necessary in the Army to admit men into hospital in the acute early stage of gonorrhœa, I first give a *résumé* of the in-patient routine practised at Woolwich during the years 1905 to 1908, which, I think, will conclusively demonstrate that gonorrhœa is not so quickly cured as some persons imagine, but that the treatment of this disease is fraught with great difficulty, and is of vast importance in military life, where the conditions materially differ from those existing in civil communities. As far as the Army is concerned, administrative methods and system appear to be the two chief factors in prophylaxis. I consider that cases of gonorrhœa in hospital should be marked "bed" during the early acute stage: that is, about seven to ten days, according to the nature of the discharge. Milk or farinaceous diet, with five pints of barley water, porridge and cocoa as extras, should be given. During this period free saline purgatives are administered every morning, and mist. alkaline[1] every four hours. No injections or

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| Potass. nitras | 1 ounce. |
| Potass. bicarb. | 10 drachms. |
| Tinct. hyoscyami | 10 drachms. |
| Infusum buchu. | 2 pints. |

Dose, 1 ounce three times daily.

irrigations are given. This dietetic and sedative line of treatment usually prevents chordee and pain, and guards better against systemic infections, such as myalgia, septicæmia, and gonorrhœal arthritis, with or without effusion, and protects against intractable complications, such as prostatitis and epididymo-orchitis, due to backward extension. After ten days, on an average, under this treatment, the previously creamy, yellow, purulent discharge becomes thinner, whiter, and muco-purulent. The man may then be marked "up" and his diet changed to convalescent. Alcohol, spices, and much meat prolong the duration of discharge. Cases of gonorrhœa should not be treated in syphilis wards, nor syphilis in gonorrhœa wards. The rules framed in Appendix 3 tend to guard against initial neglect and ignorance in the acute stage by patients or orderlies, factors which cause complications necessitating a much longer stay in hospital. Venereal wards should be constructed with an adjacent small ward, so as to allow of the isolation and separate treatment of married and well-conducted soldiers of long service, severe cases, and non-commissioned officers. At large military stations a separate room, fitted with an electric light, bath, and increased ablutionary arrangements, is essential, also a dark room for venereal eye cases who are nursed by male orderlies.

On admission to hospital, after microscopical examination of the purulent discharge and in order to verify the diagnosis of gonorrhœa, the urine of each man should be subjected to Thompson's two-glass test daily, and the diagnosis of anterior or posterior urethritis, as the case may be, is made from this rough clinical test before irrigations are performed (*vide* Appendices 4 and 5). The "first" morning urine is passed, half into one glass, half into the second. The glasses are labelled 1 and 2. The urine in certain cases is passed in the presence of an orderly, and can be kept, if necessary, in the ward annexe to stop deception, such as substitution by the patient of a "normal" urine, or the addition of water. Fraud can be detected by the colour, specific gravity, and consistence of the urine exhibited. If the urine in No. 1 glass (*i.e.*, the first passed) is "cloudy," and that in No. 2 glass is "clear," the case is one of anterior urethritis, the gonorrhœal case sheet (Appendix 4) is thus marked, and irrigations for anterior urethritis are commenced. If the urine in No. 1 glass is "clear" and that in No. 2 is "cloudy," the case is one of posterior urethritis, the case sheet is marked "posterior," and irrigations for posterior urethritis are commenced as soon as acute symptoms have subsided, but these are not ordinarily advised under four weeks. Should cystitis or epididymo-orchitis threaten or occur, injections or irrigations should entirely cease. Subacute cystitis or prostatitis may be recognised by the "ropy" appearance of the urine, with large deposit, or by blood in the urine (smoky) in the second glass; if the cystitis or prostatitis is acute, blood is found in the urine in both glasses. Pain over the region of the bladder is usually complained of, but is relieved by fomentations every two hours.

"Anterior" irrigation commences in average cases about the sixth day, unless orchitis, cystitis, or other contraindication is present. Anterior irrigations, one pint at a time, can be employed two or three times daily; but posterior (which enter the bladder) are naturally much more severe, should be more cautiously employed, and never more than once a day, preferably in the morning. An "anterior" irrigation (half a pint), to wash out the anterior urethra, is first made before giving a posterior irrigation (half a pint). It is usual in posterior cases to give a second anterior irrigation in the afternoon. In selected cases a man should carefully syringe in the intervals, or be more frequently irrigated.

Silver salts, although advocated by many writers, are apt to cause cystitis, and should not, I consider, be used until the "gleet" stage in the third or later weeks; but the advantages of these salts are, in my opinion, theoretical rather than of practical value, and they are also very expensive. My predecessor (Lieutenant-Colonel Eckersley) abandoned them, I understand, owing to the frequency of orchitis and cystitis; I resumed, and later abandoned them for the same reason. They should, I think, be limited to "anterior" irrigations or injections in the later stages in experienced hands. Gonorrhœa, in average cases, like syphilis, has a natural tendency to resolve, quite apart from treatment, if irregular habits are not indulged in, the case dieted, and alcohol stopped in most cases. Silver salts are apt to be credited with the success primarily due to nature, *i.e.*, phagocytosis, as later explained. Anterior zinc irrigations are useful in the gleet stage.[1]

The irrigations are performed by a trained orderly under the direction of an officer. Kolman's dilator may be used in chronic cases. This instrument dilates the urethra and stretches the mucous crypts, and permits the free gonococci and pus organisms to be washed out of the crypts. A solution of permanganate of potash, 2 grains to 1 ounce and 1 ounce of this to every pint of lukewarm water (98° F.), is ordinarily used as an irrigation. The strength, therefore, is $\frac{1}{10}$ grain to 1 ounce. The strength can be increased later. About 8 pints of the solution are placed in a large measured glass receptacle, which is hung on the wall about 8 feet from the ground, the solution coming through an india-rubber tube affixed to the bottom of the glass receptacle. The distal end of the rubber tubing is fixed to a Maiocchi's "double channel" irrigation glass nozzle. The orderly sits on a stool opposite the patient, and inserts the point of the glass nozzle just inside the urethra. Over the penis is a mackintosh apron to direct the fluid into a bucket. The orderly should wear india-rubber gloves. The glass nozzle of the irrigating apparatus is sterilised before use, and should be disinfected by dipping in 1 to 20 carbolic lotion between the cases. After posterior irrigation the patient empties his bladder and shows the fluid passed. It will be noticed that as the case improves the colour of the permanganate of potassium solution is retained. The apparatus is obtainable at the Army Medical Stores, Woolwich, viz. large urine glasses, two per man (cost 4½d. each), large irrigator vessels, Maiocchi's double channel nozzle, and india-rubber tubing. Mackintosh aprons are supplied from barrack stores.

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[1] ℞ Zinc sulphate 2 per cent. ... ... ... 1 ounce.
Aqua ... ... ... ... ... ad 1 pint.

After the urethral discharge has ceased, the urine, as evidenced in the urine glasses, gradually becomes clear, and threads, in average cases, are no longer visible after six weeks. The man is then placed on beer for three days, and if the urine still remains clear and the gonococcus is not demonstrated by the microscope, he is dismissed from hospital when ten to fourteen days free from suppuration; but never under six to seven weeks if admitted with acute gonorrhœa (*vide* Appendix 4). This time-limit better guards against further medical inefficiency from relapse or swollen testicles, on return to military duty, more especially in mounted units. A copy of instructions for irrigations (Appendix 5) should be placed both in the hospital ward and also in the irrigation room for the information of soldiers and orderlies. The rules in Appendix 5 are those at present in force at the Royal Herbert Hospital, Woolwich; they are the practical outcome of personal experience in treating some 1,000 or more in-patients by irrigations during the past three years. Irrigations are more under medical control than injections by ignorant patients, but they need not supplant them, nor are they necessarily more reliable.

The only really scientific treatment which curtails the gleet stage in chronic cases is to illuminate the urethra by means of the electric urethroscope, any time after the twentieth day of disease, and use local applications of argent. nit. to the granular patch, which is present at some time in some degree in every case of freshly contracted gonorrhœa. This patch, in the absence of prostatitis, usually causes the persistence of the glairy gleet, and may give rise to stricture. By means of the urethroscope, with practice, it is quite feasible to detect the presence of the exquisitely tender granular patch. If the urethra is unduly sensitive at any one spot on the passage of the instrument, or of a No. 10 olivary catheter, one is then quite certain that the gonorrhœa is not cured. In the case of a normal urethra, there is no pain or discomfort on the passage of a medium-sized instrument. In cases of gleet the passage of a large-sized catheter is often of value. In a diseased urethra the granular patch is usually situated within 4 inches from the meatus urinarius and on the floor of the urethra. In cases of prolonged gleet a careful examination should be made for stricture and for enlarged prostate. If the latter condition exists, massage of the prostate has been suggested, and iodide of potassium is sometimes of benefit. Before a case of gonorrhœa is discharged from a military hospital a careful examination of the meatus urinarius should be made. If the meatus is red and glazed, discharge is present in despite of the man's assertion to the contrary with a view to getting out of hospital and so avoiding loss of pay. If the man denies the presence of discharge, swab the urethra with a piece of cotton wool and examine for gonorrhœa, or centrifuge the urine and examine for gonococcus, which is the more exact method. The groin should be examined for tenderness, or possible glandular enlargement, and the testicles and epididymis for tenderness, or possible epididymo-orchitis. The urethral mucous membrane should be closely examined by the urethroscope to see whether the granular patch on the floor has resolved. Failing the possession of this instrument, a black vulcanite urethral cannula with sharp edge and solid interior plug, which can be withdrawn, can be obtained from the Ichthyol Company, High Holborn, London. I used it in India for many years ; it is a simple means of localising the granular patch and topically treating it in the absence of the urethroscope. This vulcanite instrument is simply a copy of the metal tubes used with the urethroscope.

*Remarks.*—I do not concur in the view put forward by Major

Pollock, R.A.M.C.,[1] that irrigation in the initial acute stage of gonorrhœa prevents the posterior urethra from becoming infected. I consider that, although gonorrhœa is a specific inflammatory catarrh, chemical irrigations or injections in the early stage, so far from preventing, are very liable indeed to cause infection of the posterior urethra, and in the very *acute* stage are probably quite the most common cause of undesirable complications, such as epididymo-orchitis, cystitis, urethral fever, and systemic infection. Notes could be given of very many cases. Thompson's two-glass test shows that subsequent to irrigation the posterior urethra has been involved, whereas it was not so before. Rest in bed, milk diet, hot baths, hot compresses, sedative alkaline mixtures, free saline purgation, and in military hospitals an absence of fatigues in the very early stages are much more reliable remedies in preventing backward extension and intractable complications.

I have tried extensively, during the past fifteen years, most known methods amongst some 5,000 in-patients, but in the initial "acute" stage have long abandoned chemical irrigations and injections in favour of more conservative methods, and with the best results. I consider, especially when dealing with ignorant patients, that it is a retrograde step in our knowledge to unduly interfere with an intensely inflamed urethra in the very early stages, either by instrumentation or chemical injections or irrigations, which often act like instrumentation, and give rise to urethral fever and its adverse sequelæ. I claim no originality for this opinion, as it is, I believe, supported by the experience of the profession at large and conservative medical opinion. The posterior urethra is not uncommonly affected at the time a patient reports sick, and the not infrequent presence of epididymo-orchitis at the time of admission to hospital is usually due to exercise or delay in reporting sick, owing to concealment, or to injection at the local chemist's. Facts such as these preclude routine irrigations or injections until the case is more closely studied. Hence the importance of a few general instructions as given in Appendices 3, 4, and 5. After epididymo-orchitis or cystitis has been present, if chemical injections or irrigations are used too soon, severe relapses of the former condition very often ensue, and these conditions commonly mean a stay in hospital for three months before the man is fit for military duty; whereas, if complications do not ensue or persist, a man should be quite fit, as later explained, to attend as an out-patient, remaining in barracks on light duty, or excused duty, after six weeks in average cases. The fact, moreover, of the testicles swelling as the result of too early and vigorous irrigation in hospital is apt, in the eyes of the patient, to discredit the treatment, the last thing to be desired in the Army, where soldiers, owing to financial and personal considerations, are only too ready to resort to quacks and chemists. Discredit is thus unfairly thrown on irrigation, which, with limitations, is an advance on the injection treatment. I have tried, and have seen used, all the ordinary chemical injections and irrigations, and favour, once the acute symptoms have abated, warm water to commence with, followed by potass. permang., in dilute solution $\frac{1}{10}$ grain to 1 ounce as an irrigation, and $\frac{1}{2}$ drachm to two pints of water as an injection, the strength being increased in the gleet stage.

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[1] Advisory Board Final Report on the "Treatment of Venereal Diseases in the Army," page 15.

The reason why injections and irrigations necessarily fail to more appreciably curtail the total duration of gonorrhœal discharge, even amongst in-patients, is presumably due to the pathological fact that the gonococci, besides being taken up by the leucocytes as a result of phagocytosis, also effect an entry into the urethral submucous connective tissue, and give rise later in the gleet stage to the granular patch. The superficial mucous crypts in the urethral lining membrane no doubt also lodge the gonococcus; but the persistence of gleety discharge is probably due to the minute though definite *infiltration* (granular patch) in the submucous coat, which only slowly proliferates and slowly resolves, and in neglected chronic cases, or as a result of several attacks, gives rise to a thickening or a definite stricture. Irrigations, injections, and diuresis in muco-purulent stages wash away the accessory pyogenic organisms, pus corpuscles, and some of the free gonococci, but could not possibly remove gonococci embedded in the tissues until sufficient time has elapsed for exfoliation of the surface epithelium, which occurs naturally during the course of resolution of the localised inflammation. This observation is further borne out by the recognised clinical fact that cases of stricture are commonly found in association with a prolonged gleety urethral discharge, and the passage of a full-sized catheter will in some instances hasten the cure of a gleet by temporarily setting up a more acute local reaction and discharge. There is also a resilient slight enlargement of the inguinal lymphatic glands in some cases of gonorrhœa, and the leucocytes containing gonococci can thus gain an entry into the blood-stream and give rise to constitutional symptoms, such as anæmia, arthritis, fever, or generalised septicæmia. Hence the scientific treatment of resistant cases in the unduly prolonged "gleet" stage, which guards against complications, is that so ably described by Mr. Burghard,[1] viz., by means of the electric urethroscope, and local applications to the granular patch of a strong solution of argenti nitras (20 to 30 grains to the ounce.).

A large number of gonorrhœa cases, of course, naturally get well after five to seven weeks without any local treatment. This is what we would expect of a localised inflammatory process, provided we prevent a generalised septicæmia occurring by rest, dietary, diuresis, and sedative measures in the initial acute stage, and careful irrigation or injection later. In average cases undue interference with the urethra by too strong local applications is not advocated; they, no doubt, can temporarily cure the gonorrhœa, but may later give rise to stricture. It is a different matter where the prolonged gleet is already in association with a large granular patch, as this shows that a stricture or considerable thickening is inevitable. Carefully safeguarded irrigations performed by a trained person are necessarily more efficacious in the "muco-purulent and gleet stages" (*i.e.*, later stages), than routine injection practised by an ignorant patient. After the third week, the frequency, time, and manner of irrigation or injection, and not the chemical nature of these, are no doubt dominant factors in curtailing the discharge in average cases if the phagocytic power is normal. I pursued investigations in India, in 1900-1901, extending over some hundreds of cases where no injection or irrigation was ever used. I was astonished at the infrequency of complications, and the ordinary duration of urethral discharge was about six weeks; but as this was before the days of out-patient attendance the question of later relapse could not then be studied.

I believe that at the Guards' Hospital, London, a similar series of investigations was conducted twelve years ago by Colonel Fenn, R.A.M.C., at the instance of Mr. G. Lenthal Cheatle, and the latter informed me that the duration of urethral discharge averaged about five weeks or so. As the question of later relapse is not dealt with, this does not imply cure, as at this period of five weeks even in hospital a urethral discharge frequently stops for some days and then returns. Of course one is met with the admitted fact that there are prolonged cases of gleet that last much longer, and that threads may be seen in, or gonococci may be recovered from the urine, after three months or longer; but in some cases only pus corpuscles, and not gonococci, are found. I cannot admit that irrigation, even for several months, does much good in many of these prolonged cases, although it has been advocated as a universal panacea. It is in this class of case, or in the case of men who frequently contract gonorrhœa, that stricture not uncommonly results. There is often a history of several previous attacks of gonorrhœa. In some of these cases the urethral discharge persists for fourteen weeks or longer, despite most carefully supervised irrigation (including silver salts) and in-patient hospital treatment. Naturally, when a posterior urethritis or epididymitis has occurred, the average duration is ordinarily much longer (eight to twelve weeks on an average) than in uncomplicated anterior cases (five to seven weeks), so that it behoves us to prevent, if possible, the occurrence of these conditions. I consider this is best done by ensuring that the man reports sick early, before his testicles swell, and that he is first treated in hospital. If a soldier with gonorrhœa only reports sick when his testicle is swollen and he is consequently unable to walk, he ought to be "crimed" with concealment by the medical officer signing the sick report. The disease has probably been in existence seven to ten days, and the chemist has failed to cure him. I have used, and have seen extensively used, urotropin and salol as urinary disinfectants, but, like silver salts, the advantages in practice are not so obvious as well advertised, and barley water, by increasing diuresis, effects excellent results. Tonics, particularly quinine and iron, improve the anæmia ordinarily present in the later phases of gonorrhœa, and, *ipso facto*, may curtail the duration of gonorrhœal discharge by increasing the phagocytic power of the individual. Recently antistreptococcus serum (polyvalent, Burroughs and Wellcome) is advocated for gonorrhœal arthritis. I have not as yet obtained any wonderful results in seven or eight cases I have tried it on—the result being commonly negative. An injection of 10 to 20 cc. is made *per rectum*.[1]

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[1] *King's College Hospital Annual Reports*, vol. ii.

*Relapse*.—It not infrequently happens in military garrisons that men are admitted to hospital shortly after arrival at their station either with a relapse of gonorrhœa (*vide* Appendix 7), or with intractable gonorrhœal complications, such as stricture, epididymitis, and orchitis, and more rarely with arthritis, or iritis, the result of systemic infection. Gonorrhœa is a potent cause of anæmia and debility, and, when excessive smoking and beer-drinking are superadded, of that typical affection of soldiers, "disordered action of the heart," which is responsible for much medical inefficiency, especially amongst British troops. Endocarditis may occur in the course of gonorrhœa, in conjunction usually with arthritis, or a generalised septicæmia; and I have seen endocarditis follow directly on gonorrhœal ophthalmia, and death result. If a man in the first instance is adequately treated in hospital for gonorrhœa, these complications are much less likely to occur. Many soldiers, however, go about with gleet for months, either as the result of concealment or too early discharge from hospital, and only report sick either when complications occur or when awarded punishment for military offences, when they often make use of it to evade sentence of court-martial, and experience demonstrates that they commonly succeed in their object. Treatment in hospital should continue for at least six weeks in the case of a man admitted with "acute" gonorrhœa, whether the man says the discharge has stopped or not, unless threads are not present in the urine and microscopic examination of the centrifuged urine shows an absence of the gonococcus, which is in the highest degree unlikely within the above-mentioned period. There are four advantages in the above minimum time-limit procedure. (1) From the exact and recorded observation of many hundreds of cases, cessation of the urethral discharge is commonly effected. (2) Relapse cases more rarely occur in average cases, especially when cases are followed up, as later explained, on discharge from hospital, and this quite apart from the fact whether injection or irrigation is or is not used in freshly contracted cases. (3) The occurrence of the previously mentioned complications is lessened, or can be more adequately dealt with, and so the number of re-admissions is reduced. This ultimately reduces time in hospital, minimises loss of efficiency, and reduces invaliding. (4) The "disciplinary" restriction, if concealment is frustrated, which it can be by properly directed effort, is beneficial in two ways. Many men, unless shortly due for the Army Reserve, when they become free patients, wish to get out of hospital to avoid loss of pay. Consequently, when thorough treatment for six weeks is ensured, they are not so liable to expose themselves again, if prevented from leaving hospital just when it suits their convenience. Hospital fatigues, however, in large military garrisons, should not be so exclusively done by venereal patients.

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[1] No 1189 *Medico-Chirurgical Transactions*, W. Soltau Fenwick and J. Porter Parkinson, M.D.

Fatigues in the acute stage of gonorrhœa, such as scrubbing floors or other heavy work, cause complications such as buboes or swollen testicles, which mean a three months stay in hospital, and may also tend to promote concealment of disease before admission, which it is highly desirable to prevent, not only from the efficiency point of view, but also from financial considerations. If cured, men cannot make use of a gonorrhœa to evade punishment. A gleet or chancre is a valuable asset to a certain class of soldier desirous of evading the result of his irregularities, viz., punishment.

Finger, of Vienna, considers that six weeks is the average period of gonorrhœal discharge, and that injections do not curtail this period. I am of opinion that six to seven weeks is the rule amongst in-patients in uncomplicated cases, whether locally treated or otherwise. It is a common practice in many military hospitals in England and the Colonies to discharge patients from hospitals within three to four weeks of admission with an acute urethral discharge; when this is done and the soldier is sent to duty, relapse occurs in the majority of instances and the man may not bring it to notice. When acute relapse occurs the case should be at once sent for treatment in hospital to guard against complications, debilitating anæmia, and the infection of others, but morning drop (*la goutte militaire,* "tear in his eye" of sailors) can be safely and adequately dealt with by out-patient treatment. A gonorrhœal case sheet (*vide* Appendix 4), when properly kept up, gives very material assistance in estimating the cause of relapse, or of intractable complications, such as bubo, in the case of gonorrhœa complicated by balanitis or by venereal sores, and of epididymo-orchitis, bubo, and gonorrhœal rheumatism in the case of gonorrhœa. Cases of gonorrhœa complicated by the occurrence of arthritis, epididymo-orchitis, or anæmia, should, on discharge from hospital, be kept under special observation for disordered action of the heart, or endocarditis. A notification on Army Form I, 1239 (Appendix 8), should be sent to the medical officer in charge of the barracks, or to the nearest military hospital if the man is on furlough. The above complications indicate a constitutional infection, and are usually associated with fever at the onset, and later with severe and often prolonged debility and anæmia, which predispose to other diseases. This in many instances, more especially at foreign stations, permanently incapacitates the men, and renders invaliding necessary. Further, when it is considered that gonorrhœa is the commonest cause of "sterility" both in the male and female, that iritis may cause permanent damage to the eye, that ophthalmia neonatorum results from it in infancy, and that gonorrhœal arthritis often leaves permanently stiff and useless joints, the importance of obtaining accurate knowledge of these complications cannot be over-estimated. Permanent adhesions usually form when arthritis or iritis is inadequately treated. The prognosis, however, is ordinarily good, if the case is seen early, dieted, and well treated in hospital.

On discharge from hospital, soldiers can attend daily for a week under the provisions of paras. 1,080 and 1,174, King's Regulations, 1908 (Appendix 6). They remain in barracks, keep a perchloride dressing on the penis, even in the absence of obvious signs of urethral discharge, and are not allowed in the canteen. They can thus continue treatment on light duty, or be excused duty until physically fit for hard military exercises. After a week they can be inspected weekly for a month, and then discharged. By these means relapse is kept well in hand in large military stations, and inefficiency enormously reduced. Such procedure tends to prevent the infection of women in the neighbourhood and the consequent re-infection of the soldier's comrades in the garrison, as explained in the introductory remarks.

A strict record (Appendix 7) was kept at Woolwich during 1907 of all cases of relapse of gonorrhœa occurring within thirty days of discharge from hospital in a garrison some 5,000 strong, the men being inspected on discharge from hospital. There were 195 cases of gonorrhœa admitted to hospital in 1907, and only two cases of relapse, although most of the troops are mounted. During the first three months of 1908 there were twenty-three cases of gonorrhœa with no relapse. In Appendix 1 the ratio of gonorrhœa at Woolwich over a period of five years is shown with average daily sick. The reduction in numbers since 1903 is due to systematised effort, to a lessened number of relapse cases swelling the admission ratio, to careful treatment in the earlier acute phases of gonorrhœa, and, in 1907, to rigid inspection on discharge from hospital under the provisions of paras. 1,080 and 1,174, King's Regulations (Appendix 6). On September 17th, 1907, Rochester Row Hospital, London, was closed, and all gonorrhœa cases were sent to Woolwich for admission and treatment. Between September 17th and December 31st, 1907, there were 185 cases of gonorrhœa admitted to the Royal Herbert Hospital, Woolwich, twenty-two of these cases being due to relapse (eight of these twenty-two relapse cases having been transferred on September 17th, 1907, when the hospital in London closed).

During the first three months of 1908 there were ninety-five cases of gonorrhœa sent from London, twenty being relapses. The excess of relapse amongst London troops is due to the fact that the cases of gonorrhœa, on discharge from hospital, were not made to attend daily for a week on light duty, or excused duty under the provisions of paras. 1,080 and 1,174, King's Regulations (Appendix 6), when treatment can be continued even in the absence of obvious signs of urethral discharge, with weekly observation for a month, as explained. It appears to be a simple matter to arrange that throughout the British Army this should be thoroughly done; the excessive inefficiency arising from gonorrhœal complaints would then be lessened considerably. The causes of relapse, according to the statements of the soldiers so suffering, were: Firstly, hard military exercise, often on the very day after discharge from hospital—such as route marches, gymnastics, physical drill, riding, &c.; secondly, beer-drinking; thirdly, renewed association with loose women.

In the case of men who have swollen testicles during their stay in hospital, such factors as the above rapidly cause a recrudescence of disease. Soldiers, whilst actually under treatment for syphilis, and who have been recently placed on the Syphilis Register, frequently contract gonorrhœa. The dual complaints are difficult to treat, and give rise to great debility, anæmia, and much medical inefficiency.

Quite apart from the humanitarian aspect, it would appear that the interests of discipline would be better maintained in the case of prisoners suffering from venereal diseases if a regulation directed that all such cases in the first instance are to be invariably admitted to hospital and not first sent to prison, such time as is thereby lost being made up in prison on recovery. This procedure would, it is believed, absolutely prevent concealment, commonly practised by soldiers with the ulterior view of evading awards of courts-martial, and discipline would be more adequately safeguarded. Hard labour, defaulters' drill, and physical exercises will rapidly induce relapse or epididymo-orchitis, and prison life and food will markedly accentuate the debility and severe anæmia that ordinarily occur in the course of gonorrhœa and syphilis. Soldiers confined to barracks for slight breaches of discipline are not medically examined under the regulations prior to the award of punishment. They should be examined, and, if treated in hospital, the days of confinement to barracks should be made good on discharge; or, when practicable, they should be treated as out-patients under paras. 1,080, 1,174, King's Regulations (Appendix 6).

The most prolonged and the worst cases of gonorrhœa, like syphilis, ordinarily result from initial neglect or treatment by the prescribing chemist. They cannot be adequately treated whilst performing hard military duty, and exposed to all weathers on sentry or other duty. Civil practitioners should notify cases of venereal disease to the military authorities, as on the Continent, since soldiers can only be temporarily treated under such circumstances; and the expense to the public is very considerably and quite unnecessarily increased by reason of a more prolonged stay in hospital, due to resulting gonorrhœal complications. Concealment of disease largely arises from misdirected financial penalties and indiscriminate punishment. No pecuniary punishment should be awarded except for concealment. There is not at present any systematised procedure in dealing with concealment in the Army. Reports are made only in a small percentage of cases, and the punishments are apt to vary even in identical cases. If concealment reports are to be regularly made on the sick reports by medical officers, the soldier should be more regularly warned in barracks by his Commanding Officer, and when one case of concealment occurs in a company, every man in that company should be medically inspected. Thorough weekly inspections of one or two companies at a time, instead of the whole regiment once a month, have been strongly advocated by many medical officers; such a procedure, it is believed, would make the individual unit take greater interest in the matter, and would act as a check against concealment practised in order to avoid a loss of proficiency, or corps pay, whilst undergoing treatment in a military hospital.

When we consider that some 30 per cent. of all diseases in the British Army are due to venereal complaints, it appears to me that no stone should be left unturned in order to effect a further reduction in the immense amount of inefficiency arising directly and indirectly from these causes.

## APPENDIX 1.

### ANNUAL RETURN OF VENEREAL CASES.

*Local Troops, Woolwich,* 5 *Years.*

| Year | GONORRHŒA | | | | SYPHILIS | | | | SOFT CHANCRE | | | | Strength of garrison |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Admissions | Average number of daily sick | Admissions: ratio per thousand | Average daily sick: ratio per thousand | Admissions | Average number of daily sick | Admissions: ratio per thousand | Average daily sick: ratio per thousand | Admissions | Average number of daily sick | Admissions: ratio per thousand | Average daily sick: ratio per thousand | |
| 1903 | 325 | 28·27 | 59·24 | 5·15 | 477 | 54·38 | 86·97 | 9·11 | 84 | 6·13 | 15·31 | 1·15 | 5,484 |
| 1904 | 237 | 26·71 | 44·62 | 5·08 | 331 | 56·76 | 62 32 | 10·70 | 128 | 15·91 | 24·10 | 0·21 | 5,311 |
| 1905 | 167 | 20·61 | 33·83 | 4·23 | 202 | 30·30 | 41·49 | 6·14 | 55 | 6·18 | 11·07 | 1·24 | 4,966 |
| 1906 | 220 | 20·41 | 43·18 | 5·18 | 129 | 13·85 | 25·12 | 2·72 | 43 | 3·25 | 8·44 | 0·64 | 5,096 |
| 1907 | 195 | 29·16 | 41·45 | 6·18 | 87 | 12·79 | 18·50 | 2·71 | 97 | 10·98 | 20·63 | 2·33 | 4,702 |

*London Cases* (*Guards' Hospital closed September* 9, 1907).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1907 | 202 | | | | 42 | | | | 35 | | | | |

*Remarks.*—In October, 1905, the treatment of "Syphilis in-patients" by inunctions of ung. hydrarg. was commenced in place of insoluble grey oil (Lambkin's formula).

## APPENDIX 2.

### ALL VENEREAL DISEASES. *Local* TROOPS.

*Total in-patients and out-patients remaining at the end of each month at the Royal Herbert Hospital, Woolwich.*
*To show the effect of medical control and out-patient treatment.*

| Date | In-patients, "all venereal diseases," including venereal sore cases awaiting diagnosis | Out-patients, syphilis | Average strength of garrison |
|---|---|---|---|
| 1907 | | | |
| July 31 .. .. | 66 | 105 (venereal sore, 15) | 4,938 |
| August 31 .. .. | 17 | 120 ( ,, ,, 18) | 3,536 |
| September 30 .. | 26 | 86 ( ,, ,, 3) | 4,350 |
| October 31.. .. | 19 | 67 ( ,, ,, 1) | 4,131 |
| November 30 .. | 27 | 65 ( ,, ,, 1) | 4,087 |
| December 31 .. | 23 | 55 ( ,, ,, 5) | 4,097 |
| 1908 | | | |
| January 31 .. | 21 | 61 ( ,, ,, 2) | 4,217 |
| February 29 .. | 26 | 54 ( ,, ,, 3) | 4,317 |
| March 31 .. .. | 25 | 57 ( ,, ,, 1) | 4,462 |
| April 30 .. .. | 21 | 57 ( ,, ,, 2) | 4,402 |
| May 31 .. .. | 28 | 53 ( ,, ,, 2) | 4,329 |

"Venereal sore" is a term used in the Army for cases awaiting the diagnosis of soft chancre or syphilis.

## APPENDIX 3.

### INSTRUCTIONS FOR GONORRHŒA PATIENTS.

(1) Cases on admission will have their temperature taken and take a hot bath. In the case of after admissions, two No. 9 pills will be given, and mist. alba 1½ oz. in the morning, and mist. alkaline 1 oz. three times daily pending instructions from the medical officer.

(2) Cases of relapse of gonorrhœa re-admitted to hospital within a month will be recorded as such on their diet sheets in red ink.

(3) Two hip baths are kept in each ward for use of special cases as ordered by the medical officer.

(4) Lint soaked in 1 in 2,000 perchloride of mercury lotion is cut up and placed in a basin in the w.c.'s for all patients that are marked "up"; a bucket is provided for the dirty lint. The orderly will issue lint soaked in the above lotion to all cases marked "bed" six times a day. The patient must be careful that he does not touch his eyes with the discharge, or he may lose his sight.

(5) The above instructions will be read over to each patient *on admission* by the orderly in charge of the ward.

## APPENDIX 4.

### GONORRHŒAL CASE SHEET.

<table>
<tr><td>Reg. No.</td><td colspan="2">Rank and Name</td><td colspan="2">Corps</td></tr>
<tr><td colspan="2">Admitted</td><td colspan="3">Discharged</td></tr>
<tr><td>Date</td><td>Anterior</td><td>Posterior</td><td>Treatment</td><td>Remarks</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>

In the "Anterior" and "Posterior" columns record the condition of the urine as estimated by Thompson's two-glass test.

*On admission* note in remark column: (1) whether first attack, relapse, or fresh contagion; (2) complications, such as orchitis, arthritis, &c.; (3) acute or sub-acute discharge, or glairy gleet.

*On discharge from hospital.*—Note number of days free from urethral discharge after giving beer for three days. Examine for stricture or tenderness of urethra. Relapse necessitating re-admission to hospital commonly occurs if cases admitted with acute gonorrhœa are discharged to military duty under six to eight weeks. Cases can attend for a week under the provisions of paragraphs 1,080, 1174, King's Regulations, 1908, and be inspected once weekly for three weeks.

## APPENDIX 5.

### IRRIGATIONS. GONORRHŒA CASES.

(1) Urine flasks are to be marked 1 and 2 on the neck of the bottle.

(2) The first morning urine of each man will be passed: first half into No. 1 urine flask, and the second half into No. 2 urine flask. The medical officer inspects the urine flasks at his visit, and they are washed out after the visit, but not used again until the following morning. On Sundays the urine flasks will not be used unless specially ordered. A cloth is kept in the lavatories for wiping out the flasks.

(3) The orderly doing the irrigations will take the medical officer's instructions from the "Gonorrhœal Case Sheet" for each patient, which is kept with the diet sheet. Before commencing each irrigation he will ask the patient whether there is any pain, or inconvenience, caused by the irrigation, and will see that he first passes his urine. Patients with acute gonorrhœa are not irrigated for some days. If ordered, they can gently syringe themselves with warm water.

(4) *Anterior* irrigation is for the anterior part of the urethra and does not enter the bladder. Permanganate of potash, 2 grains to the pint, at a temperature of 98° Fahrenheit, is to be used three times daily, at 6.30 a.m., 11 a.m., and 2 p.m. The quantity used is one pint.

*Posterior* irrigation enters the bladder, and before allowing it to do so the anterior urethra must first be washed out with half a pint of the potass. permang. solution, 2 grains to a pint, at a temperature of 98° Fahrenheit, and half a pint of the same solution is then passed into the bladder. The patient, after receiving the irrigation, empties the fluid into a glass and shows it. *Posterior* irrigation is only done once a day, unless specially ordered to the contrary.

(5) A large glass irrigator is placed 4 feet above the level of the chair on which the patient sits. The glass nozzle of the irrigator is to be sterilised before use, and must be disinfected after each case by dipping it into 1 in 20 carbolic lotion. Extra care is to be taken with patients suffering from syphilis as well as gonorrhœa. The orderly must wear india-rubber gloves.

(6) Special irrigations of zinc, argenti nitras, &c., according to the medical officer's instructions.

## APPENDIX 6.

### KING'S REGULATIONS, 1908.

1,080.—Soldiers temporarily unfit, but for whom treatment in hospital is not essential, will attend at the hospital or inspection room as directed by the medical officer.

Soldiers attending hospital will not be permitted to leave barracks. According to medical recommendations, they will be relieved from all duties, or employed on light duties and fatigues (see also para. 1,174).

1,174.—Defaulters will be excluded from the canteen except during one hour only in each day, to be fixed by the Commanding Officer. Men attending hospital and convalescents doing light duty will be excluded from the canteen unless the written permission of the medical officer has been given.

### *Extracts from "Royal Warrant for Pay,"* 1907.

### INEFFICIENCY.

999.—If a non-commissioned officer or man is rendered inefficient (physically), by reason of venereal disease, or its effects, or from the result of alcoholism, as certified by the medical officer, he shall forfeit service pay, whether Class 1 or Class 2, from the date, inclusive, from which such inefficiency became apparent, but he may have such class of pay restored to him on his return to ordinary duty from the date on which he is considered by his Commanding Officer to have regained his efficiency. (A medical certificate of regaining efficiency is no longer necessary.)

### *Extract from Station Orders.*

*Woolwich, September 10th,* 1907.

1,235.—Medical. Soldiers attending as out-patients at the Royal Herbert Hospital should not be granted furlough unless recommended by the medical officer, and on their return should be sent up to the hospital for inspection. Commanding Officers will invariably notify the Royal Herbert Hospital when men become ineffective or leave the station.

## APPENDIX 7.

### RELAPSES OF GONORRHŒA WITHIN A MONTH OF DISCHARGE FROM HOSPITAL.

1907.

| Regiment | Rank and Name | Remarks | Days intervening |
|---|---|---|---|
| 1st Suffolk .. .. | Private C. .. | Originally treated at Woolwich.. | 4 |
| 126 Royal Field Artillery | Dr. K. .. | ,, ,, ,, | 14 |
| 1st Grenadier Guards.. | Private R. .. | Originally treated in London and transferred from London | 6 |
| 2nd Scots Guards .. | ,, F. .. | ,, ,, ,, | 10 |
| 1st ,, ,, .. | ,, G. .. | ,, ,, ,, | 31 |
| ,, ,, ,, .. | ,, H. .. | ,, ,, ,, | 1 |
| ,, ,, ,, .. | ,, M. .. | ,, ,, ,, | 2 |
| 1st Coldstream Guards | ,, M.. .. | Originally treated in London and transferred from London when Rochester Row closed, September 17, 1907 | 25 |
| ,, ,, ,, | ,, R. .. | ,, ,, ,, | 25 |
| 1st Scots Guards .. | ,, W. .. | ,, ,, ,, | 14 |
| ,, ,, ,, .. | ,, S. .. | ,, ,, ,, | 26 |
| 1st Coldstream Guards | ,, B. .. | ,, ,, ,, | 20 |
| 1st Grenadier Guards.. | Lance-Corpl. F. | ,, ,, ,, | 30 |
| 2nd Scots Guards .. | Private K. .. | ,, ,, ,, | 23 |
| 2nd Grenadier Guards | ,, T. .. | ,, ,, ,, | 23 |
| ,, ,, ,, | ,, Y. .. | Direct admissions from London; originally treated at Woolwich | 26 |
| 1st Coldstream Guards | ,, H. .. | ,, ,, ,, | 26 |
| 2nd Grenadier Guards | ,, M. .. | ,, ,, ,, | 8 |
| 1st Scots Guards .. | ,, C. .. | ,, ,, ,, | 29 |
| 1st Coldstream Guards | ,, C. .. | ,, ,, ,, | 3 |
| ,, ,, ,, | ,, L. . | ,, ,, ,, | 14 |
| ,, ,, ,, | ,, W. .. | ,, ,, ,, | 2 |
| 1st Scots Guards .. | ,, C. .. | ,, ,, ,, | 1 |
| 2nd Grenadier Guards | ,, L. .. | ,, ,, ,, | 1 |

## 1908.

## DIRECT ADMISSIONS. CASES ORIGINALLY TREATED AT WOOLWICH.

| Regiment | Rank and name | Days intermitting |
|---|---|---|
| 1st Coldstream Guards | Private L... | 17 |
| 2nd Grenadier Guards | Lance-Corporal J. | 4 |
| 2nd Coldstream Guards | Private B... | 4 |
| ,, ,, ,, | ,, G... | 23 |
| 1st Scots Guards | ,, W. | 27 |
| Irish Guards | ,, N... | 3 |
| 1st Scots Guards | ,, C... | 29 |
| 2nd Grenadier Guards | ,, W. | 15 |
| A, Royal Horse Artillery | Gunner P... | 5 |
| Irish Guards | Private Q... | 1 |
| 2nd Grenadier Guards | ,, B... | 2 |
| 1st Coldstream Guards | Lance-Corporal W. | 27 |
| 1st Scots Guards | Private A... | 9 |
| Irish Guards | ,, C... | 1 |
| ,, ,, | ,, F. | 12 |
| ,, ,, | ,, N. | 28 |
| 1st Coldstream Guards | ,, S... | 18 |
| 2nd Grenadier Guards | ,, H. | 2 |
| 1st Scots Guards | ,, P. | 7 |
| .. .. .. | .. W. | 9 |

*Remarks.*—In 1907 there were 195 admissions for gonorrhœa in the local garrison at Woolwich (average strength, 4,702), and two cases of relapse in the whole year. No relapses to April, 1908. In the last three months of 1907 there were 185 admissions for gonorrhœa from the London garrison (4,000 strong), and 22 cases of relapse (eight of these being transferred on September 17, 1907, when Rochester Row Hospital closed). In the first three months of 1908 there were 95 cases of gonorrhœa sent from London to Woolwich, 20 being cases of relapse.

Army Form I., 1,239.

## APPENDIX 8.

FORM to be used (1) when a Soldier is placed under Medical Surveillance for Venereal Disease; (2) for furnishing information between Medical Officers when cases are transferred from one station to another.

| Corps | Company | Regimental No. | Rank and Name | * Date on which case originally came under treatment |
|---|---|---|---|---|
| | | | | |
| | | | | REMARKS |
| | | | | |

To______________________________

Station and date____________________________

The Officer who places the man under surveillance will prepare this form in duplicate. One copy will be forwarded to the Officer Commanding, and the other to the Medical Officer who will have the surveillance of the man. When any circumstances arise likely to interfere with the regular attendance of men on the continued treatment list, such as transfer to another station, musketry courses, imprisonment, and especially furlough, their Commanding Officer will apprise the Medical Officer of the fact.

* When cases are transferred Medical Officers will be careful to insert the date on which the case was first placed on a syphilis register, irrespective of the number of registers the case may have passed through.

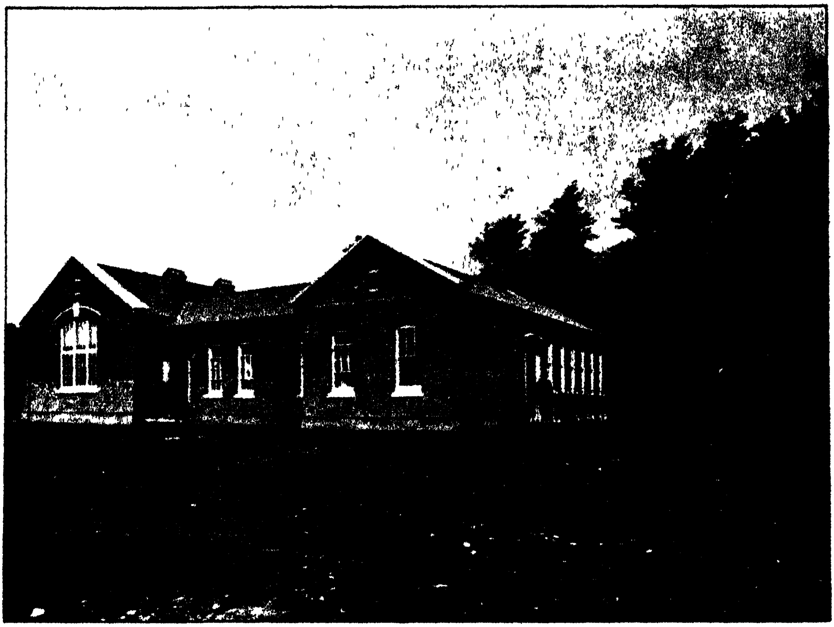
# THE SCHOOL OF ARMY SANITATION, ALDERSHOT.

*(Communicated.)*

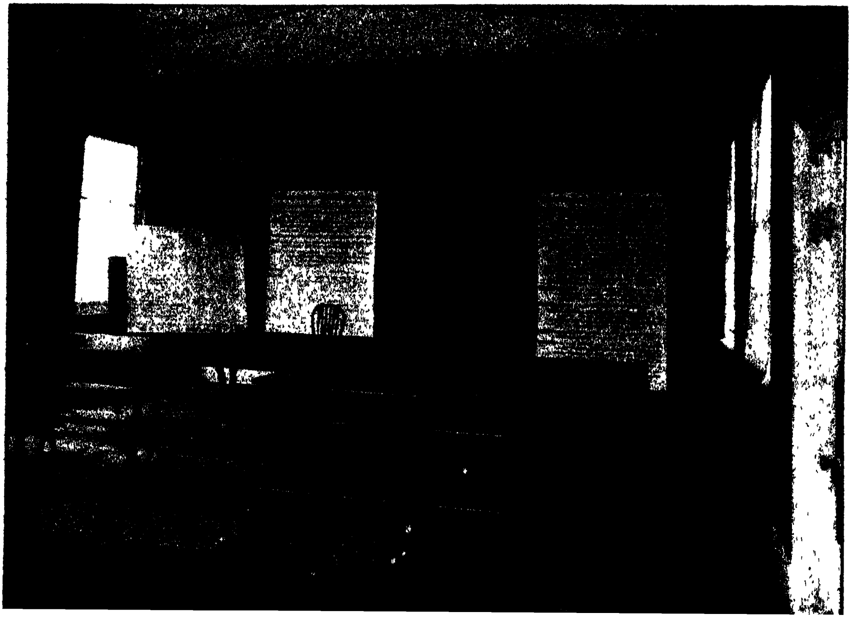
WHATEVER may be the verdict of future years upon the many changes which have taken place in the Army since the late war in South Africa, it will ever be to the credit of the Administration that it has officially recognised sanitation or preventive medicine as being a subject which concerns all ranks and all branches. In fact, the promulgation of Army Order 3 of 1908 may be said to inaugurate one of the most far-reaching changes which have taken place in the Army since the abolition of the purchase of commissions.

Closely related to the compulsory examination in sanitation of all officers below the rank of captain, is the routine instruction of the rank and file in the elements of the same subject, and the establishment of definite *cadres* for the carrying out of details of practical sanitary effort, whether in relation to conservancy or water purification. Recognising that, for the success of the scheme, a centre of instruction in sanitation was essential, one of the first steps to be taken was to establish a school for instruction where systematic classes could be held. Early in 1906 Lieutenant-Colonel Firth was sent to Aldershot to organise such a teaching centre as a part of the Depôt of the Royal Army Medical Corps. The school made a humble and unobtrusive beginning by the giving of addresses and demonstrations in sanitation within the Depôt Training School. It was soon apparent that the existing building was inadequate to meet the needs of both the new departure and the ordinary depôt courses of instruction, and that additional accommodation must be provided. A temporary home for the sanitation classes was found in one of the disused huts of the old 3rd Station Hospital. There, in a room barely capable of holding thirty men, and structurally challenging every sanitary precept, the work was carried on from April, 1906, to June, 1908.

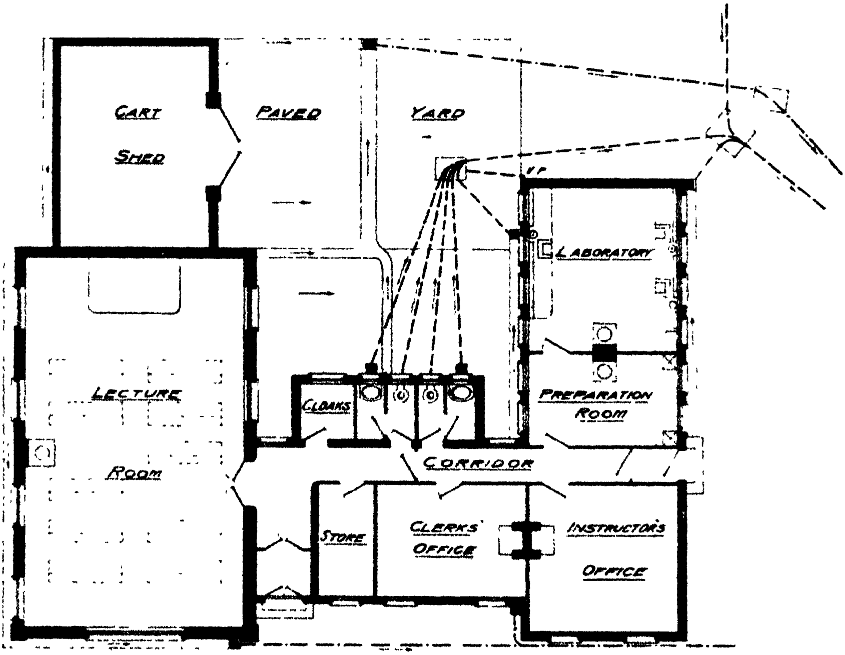
During this period seventy-five officers of various regiments, 199 non-commissioned officers and men of various regiments, and 865 non-commissioned officers and men of the Medical Corps attended courses of instruction. In addition to these, 120 officers, on probation for the Royal Army Medical Corps and Indian Medical Service, attended a limited number of demonstrations. Meanwhile, every



endeavour was being made to secure a suitable home for what had begun to be a flourishing and busy centre of technical training. These efforts bore fruit by the erection of a special and suitable building. A site was found on Middle Hill in Wellington Lines, immediately below the old quarters of the Officer Commanding the Depôt. The building was begun in November, 1907, and taken over in July, 1908; the first to attend classes within its walls being eighty-six officers, non-commissioned officers and men of the Edinburgh University company of the Officers' Training Corps of the Territorial Force.



The accompanying illustrations furnish a general idea, not only of the appearance of the building from the outside, but also of its general arrangement. Incorporated within the school building is the district laboratory, formerly housed in a small room in the Cambridge Hospital. This is not essential to the prime object of the school, but for administrative reasons is located conveniently in these new premises. The illustration gives a partial view of this well-lighted workplace, which is floored with terrazzo and suitably equipped with gas and water. The class-room is finely proportioned, measures 40 feet by 24 feet, and is extremely well lighted; it is capable of accommodating a class of fifty. The general arrangement of rooms is shown in the block plan. The frontage of the building is 73 feet, and the depth 66 feet. The cart-shed affords accommodation for various technical appliances concerned in the purification of water and disinfection, while the paved yard makes an excellent place for practical demonstrations. It is hoped that these illustrations will not be without interest to members of the Corps, who may perhaps see in them not merely evidence of the work which has been accomplished, but also an encouragement to carry on and complete the greater task which has yet to be done.



# United Services Medical Society.

## ENTERIC INCIDENCE IN INDIA, AND ITS LESSONS.

By Lieutenant-Colonel G. S. THOMSON.
*Indian Medical Service.*

It is my intention to deal with one aspect only of the enteric problem, to the exclusion of others equally important; and by contrasting similar groups of people living under the same climatic conditions, to endeavour to explain why they suffer unequally from enteric. I should like to ask, if the explanation here attempted be not the true one, what rational explanation can be substituted for it.

It is not enough for any critic to demolish my argument, he must be prepared to put forward some more cogent and reliable theory to account for the acknowledged facts. I am here, however, more to learn than to teach; and at the request of the Director-General, Indian Medical Service, very diffidently expound my views, for which I disclaim a monopoly or any originality.

A wide outlook on disease in general, and on the group of infections in particular, enables one to define disease in a Spencerian manner as the concomitant concurrence of a congeries of factors, any one of which being absent the disease cannot occur. The causative factors may very conveniently be summarised under a few headings which one might designate the "maxims of morbidity," or "the laws of disease causation," as follows :—

(1) The presence of susceptible individuals.
(2) The presence of the specific micro-organism.
(3) The presence of favourable *environment.*
(4) The presence of a time factor, *i.e.*, the delivery of the specific germ upon susceptible individuals living in the suitable *environment.*

Given an irritated condition of the alimentary mucous membrane, it is easy to understand that the constant access of specific organisms determines an attack in individuals so predisposed. All the factors, in just subordination, explain the phenomena of comparative incidence and immunity. Whether the effective access of the germ be by water specifically contaminated, by fomites, dust, flies, contact, &c., the conditions for attack are within the individual's intestinal canal, superinduced by excess proteid consumption. Underlying all those means of access comes *the*, in our opinion, missing factor, viz., "a luxus consumption of proteids."

Now this term must not be held to imply a state of gluttony as pre-existing in every victim of enteric; the rather it connotes a consumption of proteids in excess of the physiological needs of the body. The excess varies for *each* individual, and what may be excess for one might not meet the needs of the economy of other persons.

From a transcendental point of view it would be possible to construct a table of diseases against the factor of proteid consumption in excess or deficiency, such as the extreme views of Haig and Hare have led some to adopt. On the social scale this would begin at the millionaire and descend to the ill-fed, tea-and-toast nourished mill-hand of the Northern Irish linen factory; and, for diseases, from enteric and gout at the top, through rheumatism, down to anæmia, beri-beri and relapsing fever. Enteric would then stand forth as the bane of luxury, the pest of civilisation. An analysis of an array of facts from Roberts' work on enteric fever affords many confirmations of this view. The local and seasonal incidence and their variations are all readily comprehensible when one is furnished with the same master-key to unravel the vagaries of enteric. Water supplies have been improved in India, yet "we find a very considerable rise in the rates" for enteric (p. 157 *et seq.*). The later rise in the Punjab as compared with Bengal (p. 175) is explainable only on the basis of the stimulating effects of the cold season on the vigour and appetites of the susceptible *personnel* induced thereby.

The minimum prevalence during May-July is due also to the diminished consumption of proteids at that, notoriously the healthiest (*vide* p. 212), season for European troops in India; the hot weather (p. 196) confirms the influence of lessened consumption of proteids; and "the third marked rise in the enteric curve" (p. 197) and "the remarkable lowering of the temperatures" correspond with the luxus consumption view.

In military prisons in India enteric is less prevalent than outside. There are twelve such institutions in India, and they were during the quinquennium 1900-1904: at Quetta, Allahabad, Lucknow, Agra, Bangalore, Secunderabad, Fort St. George, Mian Meer, Saugor, Dagshai, Peshawar, and Poona. Most of these are notorious as "Enteric Stations." In eleven prisons during five years the total strength exposed was 771, and among these there were in all eight cases and two deaths, which give ratios of 9·8 and 2·5 per mille, whereas the incidence on the troops in the attached cantonments (strength 72,796) was at the rate of 21·1 and

4·5 per mille. Prisoners, before admission to prison, are notoriously great wanderers, and mix, in their gregarious amours, more with natives than the more orderly and better conducted men; yet, owing chiefly to lessened consumption of food in jail, they are not half so prone to enteric fever.

The details of the incidence of enteric fever on the different arms of the Service only serve to emphasise the importance of luxus consumption of proteids as the determining predisposing factor. The cavalry are better paid, more exposed therefore to the "temptation to drink" and eat to excess; for is not the popular notion among our soldiers, "The more I eat the better and stronger I must become and the better fighting man"? Given this instinct, and the stimulating effects of the first two or three years' exposure to tropical influence on his appetite, and the means and opportunities of indulging it, and the result is seen in increased enteric liability. Bangalore, Mhow, Secunderabad and Poona are not in "the endemic area," yet are notoriously bad enteric stations at all times; so Roberts' explanation is not sufficient to account for the facts. Indeed, on p. 279 he admits "the phenomena not to be confined to newly-arrived regiments, a fact which would seem to point to the operation of the special conditions to which the mounted arm is subject"; and the fact that in the same station "the cavalry exhibit special liability under what may be deemed, *prima facie*, fairly equal local conditions" entirely discounts this "endemic area" invocation as an explanation at all.

In 1895-99 the rate of attack on cavalry was 41·4 per mille, while that on the other arms with nearly three times the strength, *in the same stations*, in the same years, was 30·2 only. The age constitution of the garrison gunners explains their comparative immunity, whereas the mere youthfulness of the cavalry units (56 per cent. under 25, as against 59 per cent. in the infantry, and 88 per cent. under 30 as against 90 per cent.) does not account for this arm's greater liability to enteric. Association with horses, implying dust, flies, &c., has been adduced to explain the greater incidence on the cavalry and Royal Horse Artillery; but there are only nine British cavalry regiments in India against about forty native cavalry units, and surely those forty regiments, with an average of six subalterns in each at the susceptible age, and much more exposed to stable infection—if it exist—than those with British units, would proportionately suffer to a much greater extent. Again, most infantry units send men and officers yearly to mounted infantry courses for three months, and yet no increase of enteric has been noted in such regiments, *or any special incidence on trained mounted infantry men of infantry units*, a matter into which I made searching enquiry lately in India.

The mounted artillery, because they are well paid, and are at the susceptible age (52 per cent. under 25 as compared with 56 per cent. in cavalry and 59 per cent. in infantry), and able to indulge in excess proteid consumption, are the next most frequently attacked. The garrison artillery, having only 37 per cent. of men under 25 years of age, are not so susceptible. They have nearly twice as many men in their ranks (20 per cent. as against 10 per cent. in cavalry, 12 per cent. in infantry, and 12 per cent. in mounted artillery) *over* 30 years of age. They are experienced soldiers, from among whom the more susceptible have been eliminated, and are not so much dominated by the imperious demands of appetite, or have learned not to over-indulge themselves in foodstuffs rich in proteids, so are therefore comparatively immune.

Only a small minority of all corps escape within their first year of Indian service, and, on the other hand, there are "infected regiments," *i.e.*, the infection persistently follows certain corps, "despite change of location" (p. 280). Thus of seventy-three regiments and batteries new to India (1871-77) only nine remained free from enteric during their first year after landing (12 per cent.), and in 1895-98, when the disease was at its worst, only eighty-six corps out of 641 units exposed were free from attack (13 per cent.); only twelve of the eighty-six had less than one year in the country, and out of those twelve only two had served as much as three months in India. Again, from October, 1902, during the following fifteen months till the end of 1903, a total of thirty-eight units arrived in India, viz., cavalry four regiments, infantry eighteen battalions, artillery sixteen batteries, and of these only one battery and one infantry battalion were free from enteric at the end of 1903; the former (a very small unit, about 120 men) was exposed for the fifteen months, the latter for only two and a half months. Corps direct from England suffered twice as much as those with previous service in South Africa, where, no doubt, the disease had weeded out the most susceptible *personnel*.

In all these instances, explosive outbreaks are the exception, so that infected water in India, although a cognisable vehicle for the introduction of infection, plays quite a secondary *role*. It is only one of the means for the effective access of the specific micro-organism. The study of "company infection" disposes effectually of the idea that enteric in India is due to a common source of infection pathogenic to the whole of the susceptible community exposed. There are a great many contact cases discoverable in camps and barracks on strict investigation with the aid of dates, reckoning the incubation periods and using "spot maps."

The lessened incidence all over India in June and July is explainable by (1) the weeding out of the April maximum; (2) the drafts of younger men sent to the hills, and the absence of fresh arrivals from home, and consequent diminished contact and aggregation of susceptibles; and (3) the lessened consumption of proteids superinduced by the great heat of mid-March to mid-June in India in the plains. Everyone knows full well the absolute loathing for meat induced at this season in the plains, especially at the midday meal in India.

That only a minority of susceptible men acquire the disease excludes common agency in infection, and is dependent on the varying proteid consumption owing to individual predilections and habits of "domestic economy." This explains the apparently capricious and at the same time SELECTIVE AFFINITY of the disease. It will be seen that enteric reached its maximum in 1898 and fell during 1899-1901. The cause of this fall, which has not been maintained, was the almost entire absence of drafts during the Boer War; hence the lessened supply of young and susceptible individuals.

To explain the excessive relative incidence of enteric on officers as compared with the rank and file, what facts are offered? The age factor cannot be invoked to explain it; for only 38 per cent. of officers with British troops are below 25 years of age. Their ratio of attack is 30 per mille for all India (1895-1903), whereas the garrison artillery, with about the same age composition (37 per cent. below 25), only suffered at the rate of 15·4 per mille during 1895-1900, *i.e.*, about half as severely!

The fact that officers suffer more in the Punjab (33·9 per cent.) than in the Bengal (28·8), Bombay (27·5), or Madras (20·0) commands is very easily accounted for by the stimulating and enervating effects of climate there in increasing and lowering food proteid consumption respectively; and on no other grounds can this relative incidence be satisfactorily explained. It is admitted that the number of new arrivals among officers annually is about the same as for the rank and file (25 per cent.). The lessened powers of resistance, owing to habits of life, decide the relative incidence. Enteric in Europe is prone to attack the better classes socially; it is the bane of Western civilisation everywhere, superinduced and predisposed to by a luxus consumption of proteids. Individual predisposition is the most important factor, and excess in diet lowers the individual resistance of those otherwise susceptible by age and recent arrival in India.

The difference in dietetic customs predisposes to intestinal derangements and alterations in the structure and functions of the lining mucous membrane, whereby the specific germ can gain a foothold and become evident in disease and disturbed equilibrium. The fact that officers of the Indian Army in native regiments are much less subject to enteric than officers in British regiments in India requires explanation. Their ratios are as follows:—

ENTERIC MORTALITY OF OFFICERS IN INDIA, 1894-1905.

| | Officers: Ratios per mille of strength | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year . | 1894 | 1895 | 1896 | 1897 | 1898 | 1899 | 1900 | 1901 | 1902 | 1903 | 1904 | 1905 |
| European troops .. | 5·75 | 6·72 | 6·31 | 9·01 | 10·17 | 5·14 | 4·77 | 3·32 | 4·29 | 4·19 | 2·59 | 3·58 |
| Native troops .. | 1·59 | 1·88 | 1·89 | 2·62 | 2·42 | 1·34 | 1·20 | 1·30 | 3·67 | 1·79 | ? | 4·41 |

The ratios of attack for 1905 are: European troops, officers 21·5, actual 50; native troops, officers 18·2, actual 33. Death-rates 3·58 and 4·41 respectively.

In 1897-98, officers of both services were exposed during the Tirah campaign; in 1899-1901, owing to the Boer War, there were fewer new arrivals, and the rates fell considerably, as we have seen already. In 1900 there were only 88 recruits to the commissioned branch of the Indian Army, in the first ten and a half months of 1901 there were 101 such recruits, whereas from mid-October, 1901, till the end of 1902, no less than 231 joined the Indian Army; hence, in part, the exceptionally heavy incidence on Indian Army officers of enteric in 1902. The age factor, in part, helps to explain the hitherto comparative immunity of Indian Army officers, for 22 per cent. only of them are below 25 years of age, as against 38 per cent. in the British troops category. Again, most Indian Army officers must serve at least one year with British troops, and so the most susceptible are eliminated before they join the Indian Army; the Indian Army is the most married service in the world, and their messes are more manageable and better under control than in British regiments. The marked increase amongst young officers of the Indian Army in recent years cannot be accounted for, however, entirely by the age constitution. It is a fact, indubitably evident, that the young officers latterly carry over to the Indian Army the habit of a big mid-day tiffin with them; and what used to be the exception in a native regiment is now rapidly become the rule; a square meal, with cake and Madeira, &c., &c.—in a word, luxus consumption of proteids. Hence, in our experience and view, the great increase of enteric in the Indian Army officers.

That European women in India suffer relatively less than the men is attributable to their age constitution being higher, to fewer susceptible new arrivals, and to their lessened (comparative) consumption of proteids. Latterly their age constitution has been lowered, and this has produced an increased prevalence, in spite of improved hygiene and greater sanitary effort.

The disease exhibits since 1902 (when the disturbing factors towards lessening of fever, drafts, &c., owing to the Boer War, were removed) a strikingly proportionate increase in officers, rank and file, women and children among the Europeans in India. Officers showed in 1904 an admission-rate and death-rate per 1,000 of 20·3 and 2·59 respectively. The only disease that has *not* yielded considerably to the efforts of hygiene is enteric; in fact, there has been no diminution in the morbidity of enteric in India, although the mortality-rate has progressively diminished.

Enteric in 1904 caused 34·7 per cent. of the total deaths among the British troops in India. It is increasing among British officers attached to the Indian Army; the figures for 1905 are the worst on record, and the officers again suffer more than any other class. In spite of sanitary measures for amelioration (which have reduced bowel complaints and "other fevers"), enteric claims an ever-increasing number of victims, and this increase is in much the same ratio in all the associated "meat-eating" classes.

In all classes of Europeans in India, therefore, the relative incidence of enteric is proportionate to their greater or less consumption of proteids. The officers stand highest, 20·3, then the men 19·6, women 8·7, and lastly children 6·4, rates per 1,000 of attacks to average strength for 1904. That is, the relative susceptibility of the *personnel* is affected by their dietetic habits.

The seasonal prevalence, place infection, and special incidence, on certain corps and arms of the service, and the comparative rates for officers, men, women, and children, are facts that can only be explained on the luxus consumption theory, as the basic predisposing factor in the disease's causation. "The germ of enteric requires for effective attack some contributory traitorous assistance on the part of the individual, some derangement of the tissues in which its affinities lie. The Peyer's glands afford a *locus resistentiæ minoris* to the bacillus, owing to the effects of irritation and inflammatory lesions of the protective lining epithelium from excess in the amount of the food. Both predisposition and immunity, therefore, depend chiefly on intrinsic cell properties; and so the natural means of defence may be enhanced or depraved by the food we eat."

The relative immunity of natives, who are non-meat-eaters, to the disease is the crux of the problem, and exhibits the other side of the shield to complete our proof of the luxus consumption of proteids as the chief predisposing factor.

Opinion has veered from[1] a total denial of the existence of enteric among natives to a wholesale assumption of its universal prevalence. Ewart and Norman Chevers first pointed out the occurrence of cases in India, although they recognised its comparative rarity. The difficulty of obtaining evidence (owing to the objections to *post-mortem* examinations in India), definite and positive, has led to the denial of its existence. In jails and elsewhere of recent years the material for differentiating enteric from "other fevers" has been accumulating and gaining in force. In this connection, the mere presence of ulceration of Peyer's patches does not warrant a diagnosis of enteric, and may lead to error. Modern methods of research, notably Widal's test, *and the isolation of the specific* Bacillus typhosus *by Conradi-Drigalski's medium, or other reliable means, are the only safe grounds for a positive conclusion*, taken in conjunction with the clinical evidence. The idea that "natives are saturated with the disease" is one to which our experience and the evidence adduced do not compel us to subscribe. The immunity of natives may be ascribed to racial inheritance, or may be naturally innate. The races that enjoy a marked relative degree of immunity from enteric, as compared with Europeans under similar conditions of exposure, are Arabs, Egyptians, Fellaheen and Soudanese, Japs, and non-proteid-in-excess vegetarians of India and elsewhere generally.

On p. 375 Roberts states his "inability of establishing precisely and finally either the measure or causes of the relative immunity"; but our supplementary invocation of increased proteid consumption explains all such deficiencies in Roberts' thesis.

The fact that we notice no explosive outbreaks among comparatively immune natives, either in youth or childhood, excludes the saturation theory as an explanation of their undoubted comparative immunity. The idea that they suffer as children, and recover from mild and therefore undetectable infection, raises a demon of exceptional vital resistance on their part which they do not possess when attacked, as they occasionally are, and is belied by the records. Personally, my belief is, after nineteen years hunting for evidence among a population of 10,000 men, women and children, almost constantly under my professional care, that natives do not suffer except when their habits approximate to Europeans as regards proteid consumption in excess, over the limit for the individual. In the case of such large groups as the men of the native army and prisoners, the diagnosis is confirmed by scientific methods in capable hands, and shows that the case mortality of enteric in natives is very high. During the past two years the blood sera of 100 young persons in the regiment, all natives under 30 years old, from seven weeks and upwards, and all meat-eaters, have been tested by Widal, 1 in 40, and against paratyphoid A and B, micro- and macroscopically, with controls and in Wright's sedimentation tubes, &c., and only 5 per cent. gave a distinct positive reaction to Widal; all were negative to paratyphoids. Four other independent and skilled observers carried out and confirmed the tests on those 100 young persons. As Widal is a reaction of infection, surely if natives are saturated with enteric as children, more than 5 per cent. of specially selected youngsters should give a + Widal?

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[1] *e.g.*, Moorehead, "Disease in India": Typhoid *unknown in India*, p. 307. Ranald Martin does not mention it!

The difference in dietetic habits among more primitive races protects them, as seen in the comparative rarity of enteric in rural communities, and the poorly fed Irish, at home and abroad. The marked difference in the diet of Europeans susceptible to enteric and that of natives comparatively immune cannot fail to affect the reaction to disease stimuli by the alterations it produces in the lymphoid tissues implicated in enteric lesions. Especially must a combination of alcohol, often to excess, with a meat diet tend to that state of auto-intoxication and enhancement of auto-toxic putrefaction, and virulence of the bacillary content of the intestines, which lowers the resistance of its living mucous membrane, and makes the man addicted to luxus consumption of proteids a prey to enteric. If enteric were at all common among natives of India, the skilled diagnosticians in the Indian Medical Service would surely note it in the 20,000 recruits annually joining the ranks of the Indian Army, or in the 450,000 who pass through the jails every year. At Yerrowda Jail (average annual strength 1,452 in 1904), near Poona, only two suspicious cases of enteric have been seen during twelve years, and *post-mortem* examination failed to confirm the suspicion of enteric in them. Yet there is abundant material and opportunity for epidemic outbreaks, as to which the evidence is entirely and conclusively negative, among men aggregated together in circumstances favourable to its spread.

Contrast the spread of enteric and tuberculosis in India within the historic period, and no support accrues to the conclusion that the disease has been endemic here. On the contrary, it now rages every year in places (*e.g.*, Poona) where, forty years ago, young and newly arrived men were not attacked (Roberts, p. 389 and p. 40). Dr. Bryden gives an example in the case of Poona, where four new regiments were stationed in 1871-75, with total death-rates of 4·5 to 13 per 1,000, and only three deaths from "fevers" among the four corps in four seasons—a marked contrast to the records for recent years. He states that one of the corps, landed in April, included 539 boys out of a total of 897; therefore the susceptible material in four new regiments was very abundant.

Enteric has increased greatly in the East, and a study of the incidence of the disease on different races in India gives evidence that diet determines a relative predisposition to immunity from it; "for in so far as this approximates to European standards, there appears to be an increased liability. Gurkhas (natives of Nepal) are over six times more liable to enteric than the other native (Indian) troops. The total strength of Gurkhas is about one-thirteenth of the whole army. "They are aliens, and large consumers of meat and alcholic stimulants" (Roberts, p. 429), and thus differ "from the majority of the natives of India." Now, the Sanitary Commissioner for India Reports for 1890-91-92 state that 107 cases of enteric were returned from fifty-six regiments during the triennium, with the widest distribution in place, but of the total no less than thirty-seven were recorded in 1892 in four regiments of Gurkhas, so that the other seventy were distributed over fifty-two separate corps.

It will be noticed that where the disease does occur it is recognised by the Indian Medical Service officers, and this discounts their supposed failure to diagnose enteric in natives elsewhere in India. The remarkable contrasts in the records for the different races under observation is *the* most significant fact in the returns published by the Sanitary Commissioner in India. How can we account for this relative incidence on the Gurkhas? The Gurkhas may be termed the "Highlanders" of India, for they have the same habits, vices, and amusements as their

Scottish comrades in arms. They smoke, worship Bacchus, and are gregarious in their amours and worshippers of Venus quite as much as their European *confrères*, and suffer from the same diseases, including delirium tremens, venereal, enteric, &c., down to "itch." Most important of all in this connection, they all consume meat—"*though, doubtless, in inconsiderable quantities on a European standard on ordinary occasions*, but still they are in this respect marked off from the great mass of the people" (Roberts, p. 447). This both explains their liability above others in the Indian Army, and their comparative immunity as compared with European troops who normally, *and nearly on all occasions, eat animal food to excess.*

The "environment" of the Gurkha is just the same as his comrades in the Indian Army who are comparatively immune from enteric, chiefly because, we contend, they are vegetarians to a large extent. In Egypt, according to Sandwith, where the dietetic habits of natives approximate to those of Europeans in respect chiefly to the consumption of animal food, we find a relative liability to the disease, and such is the case in India. Roberts, on p. 447, practically admits this contention, but invokes other theoretical considerations; but all he adduces applies with equal, if not greater force to the other castes in the Indian Army.

On pp. 449-50, Roberts gives the regiments attacked in 1904 (when enteric reached the highest point in the Indian Army, and the incidence on Gurkhas was exceptionally low), the constituent castes, and the localities occupied; and adds, "the list of castes speaks for itself as including an overwhelming proportion of those *whose rules permit the consumption of meat, and who ordinarily avail themselves of it.*"

The latest returns available for native troops &c., in the Indian Army are just to hand, and are reproduced as follows:—

| ENTERIC .. | 1891-1900 | | 1905 | |
|---|---|---|---|---|
| | Admission-rate per 1,000 | Death-rate per 1,000 | Admissions | Deaths |
| European troops .. .. | 24·2 .. | 6·46 .. | 16·1 .. | 2·99 |
| Natives (including Gurkhas) .. | 0·3 .. | 0·09 .. | 1·1 .. | 0·28 |
| Gurkhas only .. .. .. | 1·4 .. | 0 38 .. | 6·0 .. | 1·30 |
| Prisoners .. .. .. | 0·3 .. | 0·12 .. | 0·6 .. | 0·14 |

The enormous increase in Gurkhas (nearly five times as many admissions and four times the death-rate as compared with 1904) is very striking, whereas the jail population (not overfed, certainly) remains about the same—0·6 and 0·14 against 0·5 and 0·13, comparing 1905 and 1904 ratios.

In the civil population in the Punjab, by contrast, enteric is very rare. Colonel Browne, I.M.S., Principal of Lahore Medical College, only met with eleven cases in 1,200 fever patients, of whom four died in hospital, and the diagnosis was confirmed at the *post-mortem* examinations; and his opinion was "that the disease had some relation to the dietary of the patients." "The more closely the native assimilates his diet to that of the European, the more liable does he become to the disease." Meat-eaters, including some Brahmins in this category (those not bound by caste rules), those with no caste (Parsis), and those above caste prejudices (native aristocracy), suffer in India from enteric.

Towards an author to whom one is indebted for such a host of recorded facts, it seems ungrateful to adopt a critical attitude; but one is compelled to dissent from Roberts' deduction that there is an "endemic area" for enteric in India; and he invokes this as an explanation of the local and seasonal incidence of the disease. The fact that seven of the most enteric-stricken stations are excluded *by him* (p. 135 *seq.*), which are not in his "endemic area proper," and that they give 28·3 per 1,000 cases as against 31·7 in the latter, goes far to nullify the assumption. Those seven stations are Quetta, Poona, Nasirabad, Deesa, Mhow (all Bombay Command), Secunderabad and Bangalore (in Madras), and have not any close physical characters with continental India, except that they contain large numbers of susceptible young men, chiefly of the cavalry branch, all more or less luxus consumers of proteids. Take the same susceptible *personnel*, with the same habits, and place them anywhere, and they will get enteric. Again, in 1905, other Presidencies than the so-called endemic area have shown a *greater* incidence of enteric. For instance, the Western Command shows, *among women*, a 9·2 ratio *versus* 9·5 for the Northern Command, and 11·6 in Secunderabad, whereas all India is only 8·6 per 1,000 of strength. Again, children in the Western Command give a 10·1 ratio, the greatest of any Command or Division, *against* 5·0 for all India, and in 1904 the Western Command ratios were higher than elsewhere in India. In the Army Medical Department Report for 1903, p. 216, it is stated: "The Bombay Command, for the fourth year in succession, had the highest admission and mortality ratios for the year"; and in the report for 1905 (latest available), p. 234: "It will be seen that the Secunderabad Division comes first with an admission-rate of 22·4 per 1,000, then the Eastern 21·2, Northern 20·6, Western 20·1, and troops on the march 9·7; Burma comes last with an admission-rate of 3·7 per 1,000. The Northern Command includes the most of Roberts' endemic area, and ranks third only in 1905, and it was third in 1903. When one comes to look at the jails in India, one finds that the endemic area does *not* show a preponderance of admissions for enteric :—

ENTERIC AND REMITTENT FEVER AMONG PRISONERS, BY PROVINCES.
MEAN RATIOS, 1895-1904.

| Province | Aggregate strength | Enteric | | Remittent | |
|---|---|---|---|---|---|
| | | A | D | A | D |
| Madras | 91,863 | 0·9 | 0·32 | 1·6 | 0·15 |
| Central Provinces | 48,268 | 0·8 | 0·33 | 4·4 | 0·87 |
| Burma | 125,555 | 0·4 | 0·22 | 9·2 | 0·43 |
| Punjab | 132,986 | 0·4 | 0·15 | 3·3 | 0·52 |
| Bombay | 86,780 | 0·3 | 0·13 | 11·4 | 1·69 |
| Bengal | 184,761 | 0·3 | 0·10 | 6·7 | 0·71 |
| United Provinces | 296,042 | 0·2 | 0·08 | 4·8 | 0·32 |
| Assam | 12,581 | 0·2 | 0·08 | 8·8 | 1·91 |
| India | | 0·4 | 0·15 | 5·9 | 0·61 |

excluding the convict settlement (long-term prisoners) in the Andamans, from which no case of enteric has been reported (Roberts, p. 454).

Now in Madras, along the West Coast *alone*, we meet with enteric as an endemic disease among natives in India; and on p. 466 of Roberts' book the Medical Officer of Malabar is quoted as seeing every year twenty to thirty cases in the chief town, Calicut (and there must have been more he did *not* see), among a population of 76,000. "House epidemics have been noticed"; the diagnosis has been verified by the Widal reaction, and *by the discovery of* B. typhosus *in the urine*. The disease, according to Major Donovan, is observed chiefly among the middle and upper classes, and prevails mostly in the large town of Bangalore, being most prevalent from June to October. This West Coast is inhabited by Muhammadans and Moplahs and other non-Christians—*all meat-eaters*. All officers, competent to judge, who have had ample experience elsewhere, agree that enteric prevails in Malabar and South Canara, and is quite peculiar to these particular areas. Now the caste composition of these areas shows a ratio of Muhammadans and other non-Christians to Hindus of 1 to 4, as against 1 to 10 for the Presidency; and in Calicut (where the disease is most prevalent) the Muhammadans and Christians comprise 80 per cent. of the total population, and in Bangalore aggregate 74 per cent.;

so that, excluding low and other caste Hindus, such an enormous meat-eating populace exists nowhere else in India. Again, it is notorious that pork in Madras is almost the staple diet of Christians and the lowest castes, especially in this area; and the habits and diet as regards luxus consumption of proteids of the whole of those peoples assimilate to those of Muhammadans and Europeans. Nowhere else in India exists such a native meat-consuming people, and nowhere else in civil life in India is enteric so endemic!

Coincident with this enteric prevalence, the jails in Madras show a great number of cases of enteric among the prisoners admitted from the largely affected civil population. No appeal to errors in diagnosis can discount the real fact—prevalence of enteric on the West Coast of Madras and in the Madras jails *among meat-eating peoples.* This is the one factor that explains its incidence on the prisoners and their civilian friends in the same area. It is unscientific to impugn the evidence from jail returns on the one hand, and to accept the overwhelming "authentic data" from those competent to judge with ample experience.

"All meat-eaters" (Roberts, p. 462) are liable, no matter of what caste or colour. "Enteric is rare among non-Christian native women and children." It is "commoner among natives than formerly, owing to a change in the habits of the people in the direction of more Western modes of life" (quoted from medical mission doctors in very intimate relations with the people).

The evidence from the facts related by Roberts is cogently confirmatory of the luxus consumption theory, and is too long to reproduce in detail here (*vide*, for civil population, pp. 461-478). The properties of the tissue-cells evolved under the conditions of their lives, as regards meat-eating, mark civilisation as the true causative agent plus the *B. typhosus,* which latter is the effective pathogenic agent. The less consumption of proteids by those comparatively immune is the measure, the quality, and the basis of that immunity which the evidence appears to demonstrate. The conclusion of the whole review is that the condition of the intestinal canal of those insusceptible, and *vice versa*, is the determining factor *par excellence*, and this is further borne out by their non-liability to attack in foreign countries (Roberts, p. 440). Finally, enteric is comparatively rare among domiciled civilians in India; those who get it dine at a club or regimental mess (Roberts, pp. 410-412), or indulge every day in tiffins largely consisting of meat, &c., in excess. It is a fact that most Indian Civil Service men have office from 11 a.m. till 5 p.m. almost daily, and rarely, up till lately, indulged in tiffin. Only eight of the Indian Civil

Service covenanted officers, out of a total of 1,255, which includes 33 per cent. of the ages 24-29 (and first six years service), and therefore, presumably, most susceptible, have died of enteric during five years ending 1905. Twenty per cent. of the total may be absent on leave from India. It is consistent to find that seven out of the eight deaths took place in young men under 29 years of age, and within their early years of service in India. Still the death-rate among soldiers of the same age "is nearly twice that of the civilians in the Indian Civil Service" (p. 412). No less than five of these eight deaths were within the first year of service—chiefly among young men sharing quarters with regimental officers (more susceptible, instead of only half, or less, than the soldier), and frequently dining as guests at regimental messes.

This comparative immunity of the Indian Civil Service officials holds all over India; for in our own experience in a Sadar town of 30,000 inhabitants—with a district 30 by 40 miles in extent, and a native population of one and a quarter millions, including forty-five Europeans, Indian Civil Service officials, ladies and children (aggregating 100 total individuals exposed probably during three years)—not a single case of enteric was seen during three years. In marked contrast, two companies of British troops quartered there (with an annual average strength of 239, four officers, three ladies and four children, seven women and twelve children) had two to three cases every year, and two deaths from enteric; whereas the native troops (average strength 625) never returned even a suspicious case, and the disease *was unknown in the annals of the district.* To what can the comparative immunity of the Indian Civil Service men, native soldiers, and civil population be attributed if not to their dietetic habits, as contrasted with those of the British soldier?

Considering the vast number of fully qualified observers who come to India yearly, the difficulty in recognising a disease with which they are well acquainted both in theory and in practice cannot be understood—*if it exists.* It is one of the very first problems which every medical officer appears impelled to tackle and incited to solve satisfactorily. "It is impossible that a well-defined disease with which every medical man is more or less familiar, and which causes death in 30 per cent. of the cases, should be overlooked under a scrutiny which has extended in ever-increasing vigilance over a quarter of a century" (Roberts, p. 453). Now 40 per cent. of our prisoners are within the period (18-30) of age incidence for enteric, and so are the majority of native troops; yet year by year the rates for enteric and "other fevers" over a long series of years are identical; and the fact that the disease is recognised where it occurs among Gurkhas, must be accounted for. Enteric is not a common disease at any age among natives of India, except in urban centres, where their habits and dietary approximate to the European standard, and in the West Coast of Malabar endemic centre, where luxus consumption of proteids also prevails, in a unique manner, *for India.*

Colonel Crombie, I.M.S., noted such cases of "urban fever" in his address before the Indian Medical Congress at Calcutta in 1894. It shows several very distinct deviations from the classical enteric of text-books, and our belief is that most such cases belong to the category of the mixed infections, *i.e.*, both paratyphoid and enteric, the former predominating in the clinical picture in natives. Were the customs of the people and the conditions of life regulated in a manner similar to those of the Occident, as Hunter, of Hong Kong, notes *re* Chinese, the incidence of the disease would differ but little from that found in Western countries. The view that takes it for granted that natives are "saturated with enteric," and assumes that native infants possess a monoply of enteric infection, is based on a paucity of scientific evidence and is totally contrary to our lengthy experience. Such a view simplifies the etiological problem by dogmatic statement of a theory as yet unproven, and affords no basis of action for a preventive campaign.

A volume might be written on the details of a preventive policy, but here the main principles logically flow from our etiological premisses. Based on our scheme of disease causation, those principles involve measures : (1) against the effective access of the germ ; (2) for increasing the individual's resistance (by Wright's anti-typhoid inoculations, and dietetic reforms) ; and (3) alteration of environment of our armed forces by measures of perfect hygiene and sanitation in all it connotes.

Notification, bacteriological diagnosis, and differentiation of paracoli and paratyphoid from enteric, isolation, segregation, disinfection, &c., must be followed and anticipated by measures to prevent the men becoming, by their contributory negligence and ignorance of suitable diet, a nidus for enteric invasions. Large central dining halls, regimental dairies, and British cooks are imperative ; and in India the big meat meal should, "*by order*" be postponed till sundown, and the canteens should not be allowed to be open till *after* meals, instead of, as now, *before* them.

The entire dietary of the Army requires to be revised and regulated so as to adapt it to the wants of the soldier under the various climates in which he is called upon to serve. "Details govern the world" at certain stages of its evolution. I have a very strong conviction that European diseases in India are largely due to over-stimulation in the first year's residence. The mortality and morbidity among European troops will not be appreciably lessened by mere sanitation. Their habits must be altered radically in accordance with the teachings of the recent physiology of diet. They must understand that temperance in all things is for the benefit of their bodies. Self-control is essential to efficiency and continued health; where we hitherto blamed the climate, science puts her finger on the individual and his faulty methods of living.

Hygienic living, by precept and example, must be enforced, and an organised sanitary staff must in future instruct the officers and men how to live, "for life is not to live, but to be well" (Martial). Restaurant "messing system," with varied menus and scientific cookery, should be universal. The man in the street must be got at *eventually through our national system of education to ensure success* in the task of causing equilibrium and self-control against temptation to indulge in food to excess.

Whilst the minimal proteid requirement cannot, as yet, be laid down by science, we must needs take care not to err by excess and so induce enteric to arise. As Chittenden states (p. 474): "There is no question, in view of our results, that people ordinarily consume much more food than there is any real physiological necessity for, and it is more than probable that *this excess of food is in the long run detrimental to health*, weakening rather than strengthening the body, and defeating the very objects aimed at." How that detriment applies to enteric our investigations have demonstrated; our thesis is the particular proof in a specific instance of Chittenden's general statement:—

"Physiological economy in nutrition means temperance, and not prohibition. It means full freedom of choice in the selection of food. It is not cereal diet nor vegetarianism, but it is the judicious application of scientific truth to the art of living, in which man is called upon to apply to himself that same care and judgment in the protection of his bodily machinery that he applies to the mechanical products of his skill and creative power. Excess means waste, but of far greater importance is the unnecessary strain placed upon the body by this uncalled-for excess of food material."

## REPLY TO CRITICS.

What has been said only proves to me what I already know, that there are other factors than luxus consumption of proteids to explain the spread of enteric in special cases. My explanation amounts to a cause within a cause; and given that climate, as

I fully acknowledged in my opening remarks, plays a *great part* in the incidence of enteric, how does it *alone* explain the *comparative* incidence of those exposed to the *same* climate? The appendix shows the large excess of proteids consumed in one regiment in Poona, in addition to the rations provided, "which require but few additions," and require no abstruse chemical analysis to convince any impartial mind of what they contain.

## APPENDIX.

2ND ARGYLL AND SUTHERLAND HIGHLANDERS' DAILY SCALE OF RATIONS.
(*Vide* Paras. 289 and 290 Army Regulations, India, vol. v.)

*Peace*

| Articles | Quantities lb. | Quantities ounces | Remarks |
|---|---|---|---|
| Bread .. | 1 | .. | On the march $\frac{1}{4}$ lb. extra. |
| Meat .. | 1 | .. | — |
| Rice .. | .. | 4 | — |
| Sugar .. | .. | $2\frac{1}{2}$ | — |
| Tea, or .. | .. | $\frac{5}{7}$ | — |
| Coffee .. | .. | $1\frac{3}{7}$ | — |
| Salt .. | .. | $\frac{4}{7}$ | — |
| Vegetables | 1 | .. | — |
| Firewood .. | 3 | .. | — |

*War.* (I.A. Order 28, 1904.)

| Articles | Quantities lb. | Quantities ounces | Remarks |
|---|---|---|---|
| Bread .. | 1 | .. | — |
| Fresh meat and bone | 1 | 4 | — |
| Potatoes and mixed vegetables | 1 | .. | 12 ounces potatoes, 4 ounces vegetables. |
| Onions as much as possible | .. | .. | — |
| Rice .. | .. | 2 | — |
| Sugar .. | .. | $2\frac{1}{2}$ | |
| Salt .. | .. | $\frac{1}{2}$ | — |
| Tea .. | .. | 1 | — |
| Pepper .. | .. | $\frac{1}{36}$ | — |
| Fuel .. | 3 | .. | — |

REFRESHMENTS, *extra to rations*, are supplied (on payment) in two places in the 93rd Highlanders' Lines, Poona:—

(1) Supper Room.
(2) A.T.A. Room (Army Temperance Association).

| | | |
|---|---|---|
| (1) *Supper Room.* | —Accommodation.. | Between 450 and 550 suppers per evening in winter, and 350 to 450 in summer. |
| | Hours .. | .. 5.30 to 9 p.m.; greatest rush, 7 to 8 p.m. Before big parades cocoa and biscuits procurable. |
| | Drinks .. | .. Tea, minerals, 1 pint beer per man, coffee, milk, cocoa; spirits *not* available. |
| | Daily Indent | .. Beef, 80 lb.; mutton, 25 lb.; tongues, 20 lb.; ox-tails, 16 to 20 lb.; cow-heels, 12 lb.; eggs, 20 to 25 dozen; cabbages, 8 lb.; carrots, 8 lb.; onions, 10 lb.; potatoes, 20 lb.; bread, 250 loaves. |

## DISCUSSION.

At the conclusion of Colonel Thomson's paper, Lieutenant-Colonel **MELVILLE** asked whether any of the officers present would like to pass any remarks on the paper.

Major W. H. **HARRISON** said: As regards enteric fever, there are a great many things we know nothing about in a subject so vast as this. It is very easy, perhaps, or it may be easy, to make one's facts fit in, provided that the condition which you look upon exists at the time. Speaking as one who has served in India for a considerable number of years, I do not think there is a greater excess of typhoid fever existing among British officers in British regiments than there is among the British officers in native regiments. My own experience of the British officer in British regiments is that he is quite as temperate as the others. Then, as regards Colonel Thomson's remark that the soldier spends his money usually on sausage rolls, I might say, from my own experience of the canteens, when I used to go round I usually enquired what the men were eating, I generally gathered that the things which were chiefly purchased were such as butter, jam, and sweets. Colonel Thomson has said that the women have less enteric fever than the men, and that the children have less than the women; so I presume the child's inside contains no proteid whatever, and that the women have slightly more. In this respect you must first of all be assured of your facts. I should like to know whether there has ever been an examination of soldiers to show that they eat more proteids during the time enteric fever is high, or less.

Captain **Dorgan** thought he was right in saying that in the Japanese Army the amount of proteids in the rations was 175 grammes compared with 140 to 150 in the British Army, although, according to the regulations, they are on the same amount of diet in both cases. In India it was a special fact that the fever occurred annually. Every station had its own period of prevalence. In the Punjab in the spring the weather is hot, and as Colonel Thomson has instanced, the enteric comes on every year after the rains break in July and August, and this had been so for the last twenty years, and practically at the same time the weather becomes cooler, and the men eat more. Again, in Quetta, the enteric incidence for the last twenty years is in July, when it is very hot, but there is no enteric in the colder months. Again, during the recent war in South Africa, it was very certain our troops were not suffering from an excess of proteids. These facts do not quite fit in with Colonel Thomson's theories.

Major **Grattan**: In West Africa, I might say, the British troops suffer more from enteric than in India. I have had the opportunity of serving in both countries, and my experience is that they are very much hungrier in West Africa than they are in India. During 1905, in West Africa, most of the enteric cases occurred amongst the garrisons, and during this period the strength of the European troops was about 150.

Colonel **Melville** then passed a few remarks regarding his experience of enteric, pointing out that he had a good many years experience in this direction, mentioning also several outbreaks which had occurred in India.

At the conclusion Colonel **Melville** thanked Lieutenant-Colonel Thomson for the most interesting paper which he had read.

# Clinical and other Notes.

## FÆCAL FISTULA OF TRANSVERSE COLON—OPERATION.

By Major D. LAWSON.

*Royal Army Medical Corps.*

F. A. was admitted into Netley on August 4th, 1908, with a large fæcal fistula leading into the transverse colon in the middle line of the abdomen. In June, 1908, he had laparotomy performed elsewhere for acute intestinal obstruction due to volvulus. At the operation the colon was opened and drained for some days. On admission into Netley the fistula was large enough to admit the thumb. If he took a purgative a considerable amount of the resulting motion was passed through the fistula, and if he was given a simple enema most of the enema passed through it. He was very weak and emaciated, and whilst he was being fed up, the bowels were kept acting by glycerine enemata, and only 5 or 6 ounces of semi-solid fæcal matter then came away daily through the fistula. On August 19th he was placed on such a diet as would leave very little residue.

On August 21st he was anæsthetised with C.E. mixture. An elliptical incision, 3½ inches long, was made just to the left of the mid-line of the abdomen, enclosing the fistula. The large and some coils of small intestine were found to be adherent to the abdominal wall, and were separated. An intestinal clamp was placed on the transverse colon in the direction of the length of the intestine. An elliptical incision was made in the length of the transverse colon, enclosing the fistulous opening and adherent skin, and this was cut away. The clamp was then loosened, and without taking it off was shifted so as to clamp the colon transversely, bringing the edges of the opening of the intestine into close proximity. The opening into the intestine was then sutured transversely to the length of the gut. The edges were first united by a continuous suture passing right through all coats and slightly inverting the edges; some difficulty was found in inverting the mucous membrane. A second continuous suture, passing only through peritoneal and muscular coats, was then passed. Pagenstecher's thread was employed for both sutures. When the clamp was removed only one bleeding point required to be ligatured. The abdomen was closed with silkworm-gut sutures through all the layers. The patient made an uninterrupted recovery, the abdominal wall healing by primary union.

The diet after the operation, for the first five days, was such as would leave little residue. On the seventh day he was given an oil and glycerine enema, and the bowels were kept acting by enemata till the seventeenth day, when he was given cascara. He has since had daily doses of cascara; the bowels act easily without pain. Since the operation he has put on a considerable amount of flesh. He was discharged from hospital on September 16th, 1908.

## FRACTURES OF THE METACARPAL BONES AS THE RESULT OF "BOXING OR FIGHTING."

By Lieutenant M. P. LEAHY.
*Royal Army Medical Corps.*

With an Introductory Note by Major F. E. GUNTER.
*Royal Army Medical Corps.*

### Introductory Note.

In an interesting article on "Punch Fractures" in the *British Medical Journal* of March 28th, 1908, Mr. Harold Burrows calls attention to the frequency with which a metacarpal bone is fractured when a resisting object is struck with the closed fist.

Fracture of the metacarpal bones is extremely common. In our experience at the Military Hospital, Curragh, it is the commonest of all fractures. Of 100 consecutive fractures of the extremities treated here, eighteen were fractures of one or other of the metacarpal bones; of this number twelve were caused by boxing or fighting. Of these twelve, four were of the first metacarpal (in every case of the base), five were of the second (all but one transverse of the shaft), three of the fourth. There were no fractures of the third or of the fifth metacarpals. The commonest cause of these fractures, as Lieutenant Leahy points out, is a blow on the point of the opponent's elbow.

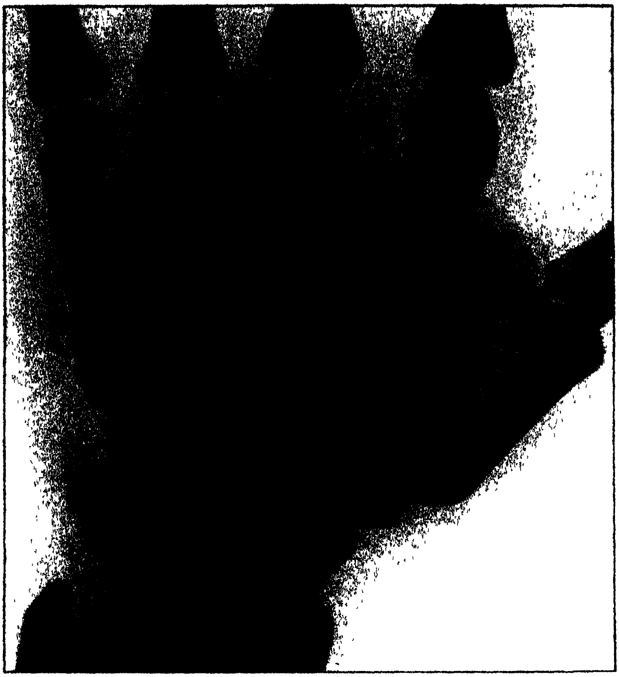
The reason why the base of the first metacarpal is so frequently broken is probably that it is driven forcibly against the base of the second metacarpal, which is well protected by its bony relations and is more or less fixed.

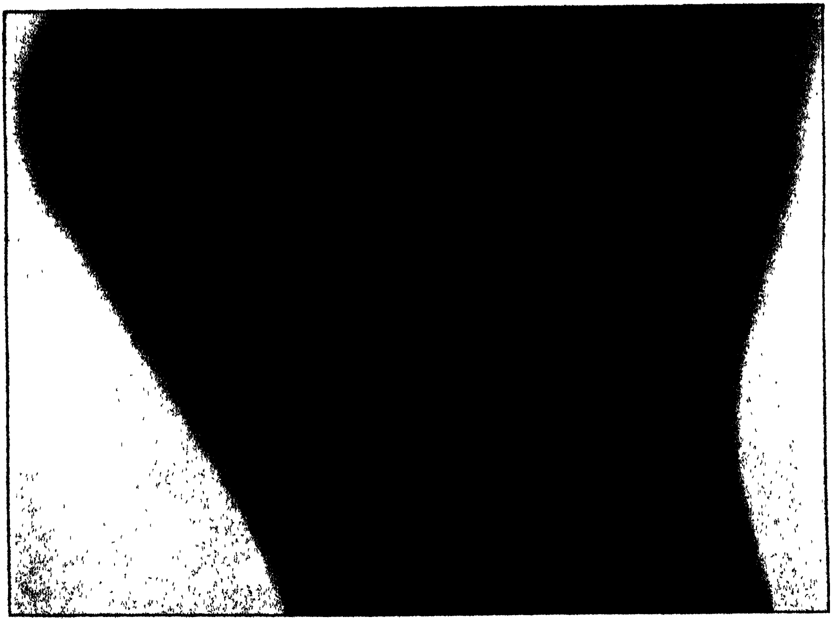
The following skiagrams illustrating the different forms of fracture, and the photographs, are by Private J. S. Thorburn, R.A.M.C., skiagraphist.

### Article by Lieutenant M. P. Leahy.

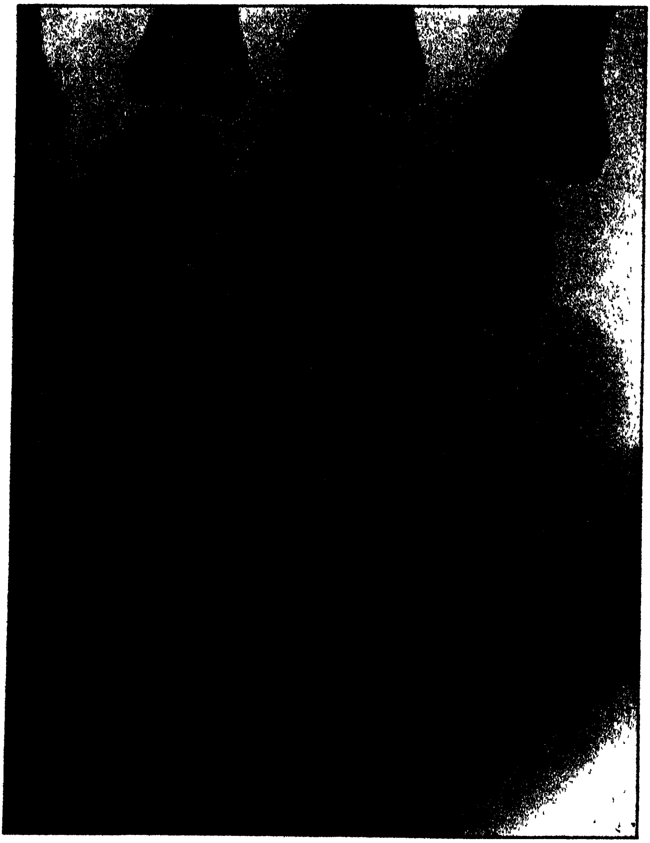
Fractures of the first and second metacarpal bones, when caused by boxing, are due to direct violence in the vast majority of cases. They are most commonly produced by either swinging or hooked blows. Blows landing on the point of the elbow or the poll—that is the top and back part of the head—are the most frequent cause of these injuries.

Before going further it may be well to define what is meant by "hooked blows" and "swings." A hook is a blow delivered with a bent and rigid arm. The force is derived from a quick, short twist of the body, the arm being kept bent throughout. The idea is to plant all four knuckles simultaneously on some part of the opponent's anatomy. Hooks

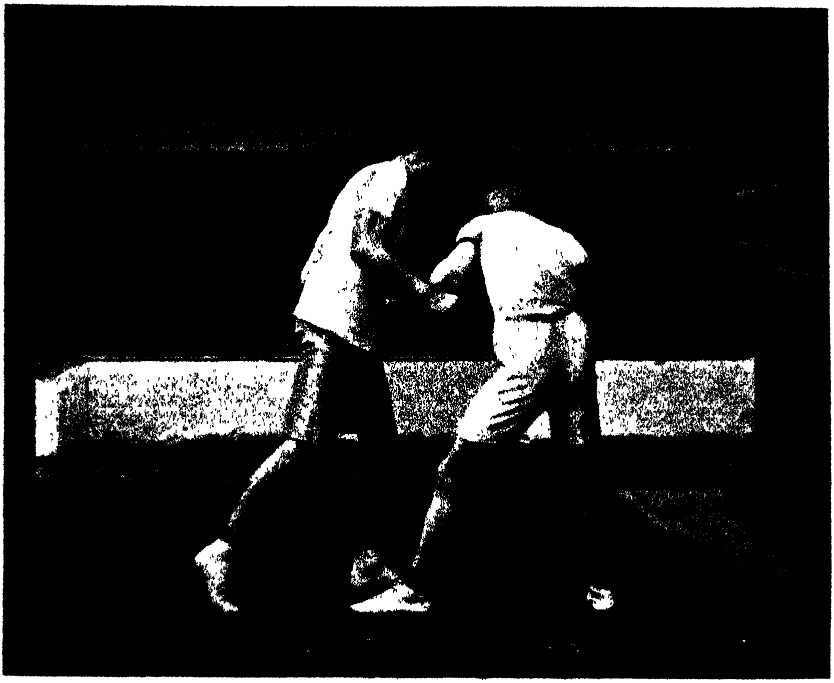




are largely used by first-class professionals. A swing, on the other hand, is delivered with a straight arm, and the force is derived from a swing of the body and a flail-like motion of the arm. In delivering a swing, one is never quite sure what part of the fist will come in contact with the enemy, but it most commonly happens that the back of the hand is the part that lands. Hence one sees how easily fracture can be produced. For this reason, and also because swings are a slow method of attack, they are rarely used by first-class pugilists.



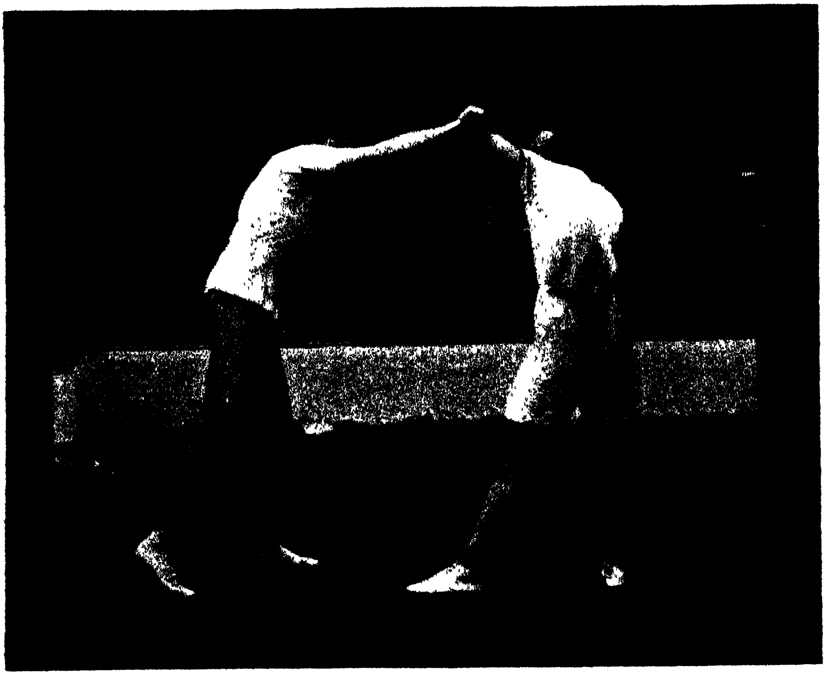
The following examples are intended to show how these fractures may be produced: Take two opponents, "A" and "B." "A" endeavours to land a swinging blow with his right fist on "B's" ribs; to get the greatest force, he starts holding his fist low down and swings it upwards. To guard this "B" presents his left elbow, flexing the forearm rigidly on the arm, and leaning down towards the same (left) side. If "B" is quick enough with this guard, "A's" blow will then land either on "B's" upper arm or the point of "B's" elbow. In the latter case the first or second metacarpals will most probably come in contact with "B's" elbow, and fracture is very likely to result. In a similar manner, the same injury may be caused if "A" tries a hook for the ribs. The accompanying photograph (No. 1) illustrates this accident resulting from a hook blow. Take another case. "A" tries a swinging blow with his right hand for "B's" jaw; to guard this, "B" presents his elbow, holding his arm with the forearm flexed rigidly on the upper arm (this guard is considered a foul in boxing competitions, as serious injuries to the hand and wrist are often produced). If "A's" fist crashes on to the point of "B's" elbow, a fracture can very easily be produced, as the whole force of "A's" blow is travelling along the same line as "B's" arm, which is fixed; therefore, if the blow lands on the point of "B's" elbow, "A's" fist meets with the greatest possible resistance. (See photograph No. 2.)



PHOTOGRAPH No. 1.—Hook blow for ribs, landing on opponent's elbow.

Again, a swinging blow aimed for the jaw, but landing on the back of the opponent's head, may cause fracture. In this case the back of the hand comes in contact with the head, and fracture has occurred even when wearing an 8-ounce glove. Quite recently I have seen two such cases.

A word about straight punches in this connection. A straight punch cannot cause a fracture of the first metacarpal bone, as, from the manner in which a straight punch is delivered, the first metacarpal cannot come in contact with any fixed bony point. As regards the second metacarpal, I have known one case in which apparently a straight punch on the jaw caused fracture. This was probably due to a bad delivery of the blow, by which I mean that instead of getting all four knuckles planted at the same time on the jaw, the second metacarpal was the only one to come in contact, and had to stand the full force of the blow. A straight punch aimed for the ribs, but landing on the crest of the ilium, might also cause this fracture.



PHOTOGRAPH No. 2.—Swinging blow for head landing on opponent's elbow. This photo is, of course, not intended to show good style in boxing, but merely to illustrate how the accident may happen.

In the early days of the prize ring, when men fought with bare knuckles, fractures of all the metacarpals were much more common. The old fighters had a very different style from that in vogue to-day. They stood square to their opponents, chest, head, and shoulders pointing straight to the front, both arms flexed, fists held on a level with the eyes, knuckles and back of hands pointing chiefly to the front. Their attack consisted largely of "chopping" blows—that is, blows delivered from above downwards—and when these blows landed on the top and back of the opponent's head, severe injuries, including fracture, were frequently the result.

In conclusion, I would say fractures rarely occur in scientific boxing. When they do occur they are the result of foul guards, such as the elbow guard described, or a faulty method of hitting, such as hitting with the back of the hand instead of the knuckles. In bare knuckle fighting, swinging and chopping blows are the most likely cause of the fracture. To avoid injuries, hit straight and aim for the opponent's body.

## A FURTHER REPORT ON TWENTY-EIGHT CASES OF PARTIAL REMOVAL OF INTERNAL SEMILUNAR CARTILAGE FOR RECURRENT DISLOCATION.

By Major F. J. W. PORTER, D.S.O.
*Royal Army Medical Corps.*

I CONTRIBUTED to the Journal for December, 1906, a paper on twelve operations for the above-mentioned disabling condition, since when I have had twenty-eight cases. All were operated on under eucaine and adrenalin (Barker's formula), and the analgesia was perfectly satisfactory in every case. Considering how extremely sensitive the structures around and inside the knee-joint are, it is really surprising how uniformly successful this form of analgesia is. The incision through which the cartilage was removed was that advocated in my previous paper. It is quite large enough to afford adequate exposure, and to remove the required section of the cartilage with a minimum disturbance of parts. I do not think the long vertical incision, which is practised by some surgeons, is at all necessary, and I believe that in the case of cavalry soldiers it may prove a subsequent source of trouble when riding. I have seen this result in one case. In only one case was it found necessary to remove the whole of the cartilage, the anterior segment being usually quite sufficient. No drainage was used in the last thirty-five cases. A variable amount of effusion occurs in every case and need cause no alarm. It is absorbed under seven days.

I have found the best way to remove the cartilage is to make a transverse incision through the thickened synovial membrane (which is practically always in this condition) about ¾ of an inch above the articular surface of the tibia. Then seize in a pair of forceps the portion of membrane which is to be removed, and cut vertically through it on to the head of the tibia as far as possible towards the middle line.

Now forcibly pull this divided part outwards and make another vertical incision on to the head of the tibia. In this way the segment of cartilage and thickened synovial membrane come away in one piece. It is always advisable to explore the joint for long fringes and to remove them. I have several times found this condition and believe that, had they not been discovered and removed, the patient stood a very good chance of a recurrence of his symptoms. I have at the present time a case of this sort in my wards who was operated on by another surgeon in May, 1907. A portion of the cartilage was removed through a long vertical incision. Within a few months he began to have symptoms of locking of the joint, which I think must be due to long fringes, and which were probably present at the time of his operation. He has several times tried to ride since his operation, but tells me that it causes a considerable amount of swelling round the scar, and the scar itself becomes very tender and painful. He refuses further treatment and is being invalided. I do not think it is possible to differentiate before operation between the symptoms which are caused by long fringes and by dislocation of articular cartilage.

The rapidity with which the quadriceps wastes in every case after this operation is rather striking, even in those where the development was normal immediately before. It is this wasting and loss of tone which is responsible for the feeling of weakness in the joint which the patient experiences when he begins to walk, and which does not pass off until the muscles have resumed their normal condition. For this reason it is not advisable to operate on a case which has been lying in bed for any length of time, in order to get rid of effusion. It is wiser to send such cases out for a month, in order to get the muscles developed before operating.

Massage as early even as the fourth day is very useful, and provided the line of incision is not approached, it is painless. It is the practice of some surgeons to put the knee up in plaster of Paris for six weeks after the operation. I think my results tend to show that this is not only unnecessary, but actually harmful, in that it leads to much wasting of muscle and entails a much longer period of convalescence. Only a very unimportant part of the capsule is divided in the operation, and this is firmly sutured by a lasting material.

The average stay in hospital (omitting two cases) has been twenty-three days. In one case I actually saw the man walk 10 miles on the twenty-first day after the operation (which was complicated by removal of a long fringe) and he repeated this feat three days later. The great majority of cases went back to duty and were seen no more. One or two required a little "riding off" after their return from sick furlough. They probably had heard of a job in civil life and were anxious to get their discharge. Now I send them out after about eighteen days, and they attend the inspection room for another ten days. At the end of this time, if they report they have perfectly recovered all movement, and the condition of the joint and muscles is satisfactory, I send them on sick furlough for one month. It is remarkable what the promise of the furlough will do in getting these cases fit. I think at least three months should be allowed after this operation for the complete recovery of the joint, although many are quite fit within two months. Scrimshanking is of course one of the evils which all Army surgeons have to contend with whenever they do any sort of operation for a soldier. One case made a desperate effort to obtain his discharge. His operation had been most successful, but he returned from sick furlough stating that his knee gave way under him. He succeeded in persuading his Commanding Officer that there *was* something wrong with his knee, and the officer would not support me in my efforts to make the man do his duty. At last, after about four months idleness, he was readmitted for examination by a board of officers, who bent his knee under gas. One or two small adhesions gave way. Having been given an excuse to get well, he recovered and has not been seen since. In one case the operation wound broke down and refused to heal. The ulcer looked suspiciously like a tubercular one. There was no apparent trouble in the joint and no effusion after about fourteen days. At the end of four months the ulcer had healed except over an area about the size of a shilling, and at his earnest request the patient was allowed to go home for Christmas. He arrived there with acute inflammation of the joint, and after his admission into a cottage hospital, amputation was found necessary. The house surgeon informed me that the cartilages were extensively eroded, and there were also physical signs of tubercle at the left apex. This man had had four relapses during his eighteen months service, and it had taken at least a month to get the joint free from fluid before operating. His powers of resistance were not good after this period in hospital, and it would have been much wiser to have postponed his operation. In another case the medical history sheet bore about ten entries for dislocation of cartilage, and he had been sent home from India for operation, which had not been performed. He was about to go to the Army Reserve, and he chose operation in preference to invaliding. His wound apparently healed by first intention, and then broke down after seven days, and took on the most unhealthy action I have ever seen. The granulations became enormous in spite of cutting them away, and constant application of caustics. Although synovial fluid ran away into the dressings for nearly three weeks, there was never at any time the slightest tenderness in the joint, and very little swelling. He eventually recovered and was invalided. There remained some slight limitation of movement, due entirely to thickening of the structures outside the joint. This was made apparent by a skiagram of both joints.

## THE SYPHILIS CASE SHEET.

By CAPTAIN O. IEVERS.

*Royal Army Medical Corps.*

THERE are, no doubt, many medical officers who, on taking over a medical inspection room, have looked askance at the syphilis case sheets, and have subsequently spent some considerable time wading through them, trying to find out how long each man has been under treatment, what treatment he has had, and what remissions from treatment. Firstly, the lack of uniformity in making the weekly entries on the case sheet affords the opportunity for several methods being adopted on one particular sheet; and in other cases the words "continue treatment" appear with an unfailing regularity, to the confusion of an officer who sees the case for the first time. Secondly, it is not easy for an inspecting officer to notice that in a long column of dates there may be, between any two dates, an interval of two or three weeks during which no entry has been made, and it is left for the officer who takes over and who has never seen the patients before to fathom out how each man stands as regards his two years course of treatment, to decide if each man is to go on taking mercury, or is to have a month or more without it—a proceeding which, if neglected, leads to the result that mercury is given continuously to a patient for many months at a time, when a month or two without it would have been much better for him. Finally, I believe there are many soldiers attending weekly and receiving mercurial treatment who, owing to an error in diagnosis, have not got syphilis at all, and what is more, have never had it. To this point I will return later.

In order to simplify or obviate these difficulties, a modification of the syphilis case sheet at present in use has been drawn up. The weekly entries have been copied from an actual syphilis case sheet. The original is not published, because in print it would not represent the jumble of dates and scrawl which it did to me on taking it over. I do not think it was an exceptionally bad specimen.

The headings of the new case sheet are based on the following three facts:—(1) A man has got syphilis. (2) That man is to have a course of treatment extending over a certain number of months, and each month can be considered to consist of four weekly attendances, irrespective of calendar dates. (3) That man, during his course of treatment, will come under several medical officers, each of whom, on taking over, will require to know exactly how long the man has been under treatment and what treatment he has had.

Several headings on the present case sheet are omitted, as they have not really any bearing on the man's future treatment; such are "date of appearance of sore," "date and place of infection," "character of sore." Information regarding the first two is of course obtained verbally from the patient, but need not be recorded on the case sheet; the character of the sore is included under a subsequent heading. The one point we have to be certain of is, has the man got syphilis? if so, then his treatment is to begin and, we hope, end in a certain period of time. This opens up the much-debated question of when mercurial treatment is to be commenced. It is beyond the scope of this article to enter into the many arguments connected therewith, but I think it is the opinion of the majority of medical officers that mercury should not be given till the diagnosis of syphilis is made certain by some other manifestation than the sore. In civilian practice we are told to wait for other manifestations, so as to thoroughly convince the man that he has got syphilis, and thereby ensure his attending regularly for treatment; and surely this is still more necessary in the service, where an error in diagnosis condemns a soldier to a weekly attendance for a year or more, to a course of mercury, which if it does him no harm, will certainly do him no good, and which means his being non-effective for probably one day a week during his course of treatment. As I stated above, and several senior officers to whom I have talked on the subject agree with me, I believe there are many men at present on the syphilis register, not because they have got syphilis, but because some officer has made a wrong diagnosis.

This divergence has been made in order to emphasize the importance of the heading "date of diagnosis and commencement of treatment by mercury." Here is one definite starting-point, not, as in the original of this case, four dates: viz., one, the appearance of the sore; a second, seventeen days later, for the commencement of mercurial treatment; a third, two weeks later, the date of being placed on the register; and a fourth three weeks later still, being the date of the first entry on the lower part of the case sheet. These dates covered a period of nearly eight weeks. Under the heading of "manifestations of syphilis" can be given the character of the sore, rash, condition of throat, lymphatic glands, and any other symptoms or physical signs on which the diagnosis is based. Two columns have been substituted for the one column usually allotted to "date." These columns represent the number of months and the number of weeks in each month from the date of diagnosis and commencement of treatment by mercury. Since the man has got to be under treatment for a certain number of months, actual calendar dates are unnecessary and lead to confusion when an officer is taking over a case sheet after it has been in use some months; the difficulty being to find out for what period mercury has been continuously administered, or for what period the man received no treatment. By doing away with dates and simply marking down the months and weeks in numbers, one can find out all this at a glance.

By way of illustration, let us suppose the case sheet to be taken over where it is marked by one asterisk. It is at once apparent from the first two columns that the man has been under constitutional treatment for ten months and three weeks; by reference to the column headed

### SYPHILIS CASE SHEET.

Serial No. in Register ...............6. Station ..... .........Fort Allahabad.
Rank and name ......Private F. S. Regimental No. .............. ...6194.
Corps .......................2/S. Staffs.
Date of admission to hospital.............14.6.06
Date of diagnosis and commencement of treatment by mercury............1.7.06.
Manifestations of syphilis...Phagedænic sore developing on a soft chancre, slight ulceration of tonsils, slight inflammation of glands in right groin, anæmic.

| Month | Week | Progress and symptoms | Weight | Albumin in urine | Treatment | Hospital or out-patient | Station |
|---|---|---|---|---|---|---|---|
| | | | st. lb. | | | | |
| 1 | 1 | Slight ulceration of tonsil, and enlargement of glands right groin; phagedænic sore | 10 4 | *Nil* | Gargle pot. chlor.; lot. nigra to sore on penis; hyd. c. cret., gr. i., pulv. ipecac. co., gr. i. t.d.s. | H. | Fort Allahabad. |
| | 2 | Throat better .. | .. | .. | Gargle, lot. nigra and hyd. c. cret. as last week | ,, | — |
| | 3 | Progress good.. | .. | .. | Treatment as last week | ,, | — |
| | 4 | Throat well; sore healed | .. | .. | Discontinue gargle and lot. nigra; continue hyd. c. cret. | ,, | — |
| 2 | 1 | Discharged from hospital. Progress good | 10 4 | *Nil* | Inj. hyd. cream, ♏v. | O. P. | — |
| | 2 | Slight congestion of fauces | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | Progress good .. | 10 3 | *Nil* | ,, ,, ,, | ,, | — |
| | 4 | No symptoms of syphilis | .. | .. | ,, ,, ,, | ,, | — |
| 3 | 1 | No symptoms.. | 10 4 | *Nil* | ,, ,, ,, | ,, | Allahabad. |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | Absent .. .. | .. | .. | *Nil* .. .. .. | ,, | — |
| 4 | 1 | No symptoms.. | 10 5 | *Nil* | Inj. hyd. cream, ♏v. | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 5 | 1 | ,, ,, .. | 10 5 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 6 | 1 | ,, ,, .. | 10 4 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 7 | 1 | ,, ,, .. | 10 2 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 8 | 1 | ,, ,, .. | 10 1 | *Nil* | No treatment .. | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| 9 | 1 | ,, ,, .. | 10 2 | *Nil* | ,, ,, .. | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | Benares. |
| | 3 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |

SYPHILIS CASE SHEET—*Continued.*

| Month | Week | Progress and symptoms | Weight | Albumin in urine | Treatment | Hospital or out-patient | Station |
|---|---|---|---|---|---|---|---|
| | | | st. lb. | | | | |
| 10 | 1 | No symptoms.. | 10 3 | *Nil* | Hyd. perch. and pot. iod. daily | O. P. | Benares. |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 11 | 1 | ,, ,, .. | 10 4 | .. | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| * | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 12 | 1 | ,, ,, .. | 10 6 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | — | ,, ,, ,, | ,, | — |
| 13 | 1 | ,, ,, .. | 10 6 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 14 | 1 | ,, ,, .. | 10 5 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 15 | 1 | ,, ,, .. | 10 5 | *Nil* | No mercurial treatment | ,, | — |
| | 2 | ,, ,, .. | .. | .. | No treatment .. | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| 16 | 1 | ,, ,, .. | 10 5 | *Nil* | ,, ,, .. | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| 17 | 1 | ,, ,, .. | 10 5 | *Nil* | ,, ,, .. | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | Soudan. |
| | 3 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, .. | ,, | — |
| 18 | 1 | ,, ,, .. | 10 5 | *Nil* | Inj. hyd. cream, ♏v. | ,, | Pretoria. |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 19 | 1 | ,, ,, .. | 10 5 | *Nil* | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 20 | 1 | ,, ,, .. | 10 4 | .. | ,, ,, ,, | ,, | — |
| | 2 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 3 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| | 4 | ,, ,, .. | .. | .. | ,, ,, ,, | ,, | — |
| 21 | 1 | ,, ,, .. | 10 5 | *Nil* | No treatment; to attend monthly | ,, | — |
| **22 | .. | ,, ,, .. | 10 4 | .. | No treatment .. | ,, | — |
| 23 | .. | ,, ,, .. | 10 5 | .. | ,, ,, .. | ,, | — |
| 24 | .. | ,, ,, .. | 10 5 | .. | Completion of two years' course | ,, | — |

Struck off Syphilis Register, July 25th, 1908.

"treatment" it can be seen at a glance that theman had mercurial treatment for the first seven months, then two months rest, and has now had hydrarg. perchlor. and pot. iod. daily for the last six weeks. The last column but one shows that he has been an out-patient since his discharge from hospital in the first instance. To take another illustration, let us suppose the case to be taken over where marked by two asterisks. As before, it is at once seen that he has been under treatment for twenty-one months, and it can easily be determined from the treatment column that his treatment during that period has been seven months mercury, two months rest, five months mercury and pot. iodid., three months rest, three months mercurial injections, finally no treatment for the last month, and is now attending monthly for observation. The column headed "hospital or out-patient" shows he has had no re-admissions.

To sum up, the advantages of these alterations in the present case sheet may be stated as follows:—(1) There is one definite date, representing the date of diagnosis, the date of being placed on the syphilis register, and the date of commencement of mercurial treatment. (2) Several headings are done away with. (3) It shows the actual number of months or weeks the man has been under treatment, instead of a column of dates from which this has to be calculated. (4) On taking over the case sheet a medical officer can very easily tell how long the man has been under constitutional treatment, for what period mercury has been continuously administered, or for what period it has been withheld. (5) The column headed "hospital or out-patient" makes it apparent whether the man has had any re-admissions during his course. (6) It ensures an entry being made each week; this could be enforced by a War Office order, and such phrases as "continue treatment" forbidden. (7) An inspecting officer can at once see if the sequence of months is correct: *i.e.*, if the sheet has been properly kept up.

## SEVERE COMPLICATIONS ARISING DURING A CASE OF ENTERIC FEVER.

By Lieutenant-Colonel J. DONALDSON.
*Royal Army Medical Corps.*

The following is an account of severe complications occurring during the progress of a case of enteric fever.

The patient was an officer, aged 23. By the twenty-third day of the illness the temperature had dropped to normal by lysis of an irregular type—that is, there were occasional evening exacerbations of temperature; but the patient was a malarious subject. The temperature had been normal for two days. At 12 noon of the third day the temperature was found to be 100° F., and the tongue and lips showed signs of dryness; pulse 112. At 12.15 of this day a severe hæmorrhage from the bowel occurred, the patient losing 3 pints of blood; there was a second severe hæmorrhage at 8.15 p.m., and the patient became semi-collapsed. The following morning a large dark patch the size of a soup plate, looking like a severe bruise and due to subcutaneous blood extravasation, was noticed over the region of the spleen and adjoining costal border. During the three days following the area of extravasation continued to increase in size, spontaneously in different parts, until practically the whole body surface was discoloured by a dark purpuriform mottling. The face and neck were not affected, but the limbs were included in the discoloured area.

On the day following the first appearance of the foregoing, the abdomen was slightly tympanitic, and this condition gradually increased until distension was extreme and liver dulness entirely lost, but there was no dulness in the flanks. Hiccough was present, and pulse 120. A rectal tube was passed and subsequently a hollow needle through the abdominal wall, but no relief was afforded by these measures. There was evidently no gas in the large intestine, nor any in the peritoneal cavity. Major J. C. Morgan, R.A.M.C., and Captain D. Harvey, R.A.M.C., kindly saw the patient with me. Captain Harvey suggested that a blood-clot had blocked the cæcal valve and so caused distension of the small intestine. In consultation with these officers full doses (min. 20 and gr. 20 respectively) of oil of turpentine and chloride of calcium were given two-hourly for three doses, and subsequently at longer intervals, and ʒi. of castor oil twenty-four hours later. Twelve hours after the castor oil was taken the distension had lessened considerably, and it soon completely passed off. He improved in every way during the two days following, and it seemed as if he might recover, but on the third day fever ranging from 101° to 103° F., associated with gradually increasing rapidity of pulse and general weakness, set in, and he died from exhaustion on the fifth day from the onset of this latter fever, which was regarded as toxæmic in origin and resulting from the disintegration of the effused blood. The case is interesting from the point of view that the patient, regarding himself as a malarious subject, had been taking large doses of quinine daily for a considerable time prior to his illness, and this fact had probably a causative relation to the curious condition of his blood which showed itself in the extravasations described above.

## A MOUNTED BEARER COMPANY.

By Major S. F. Clark.

*Royal Army Medical Corps.*

A short sketch of what, I am told, is the only Mounted Bearer Company in the Empire, may be of interest. Its headquarters are at Richmond, New South Wales, and through the kindness of Major Lane-Mullins, A.A.M.C., Staff Officer for Medical Services, and Captain

Helsham, A.A.M.C., commanding the unit, I was privileged to be present at one of its whole-day parades. This Company is for duty with a brigade of Light Horse, and belongs to the Australian Militia. At present it is on a peace establishment, but it will be best to state its war strength, which is:—

2 officers.
1 warrant officer.
3 staff-serjeants and serjeants.
3 corporals (1 a cook).
1 bugler.
40 privates (11 drivers, 2 batmen, 1 cook).
—
50

| *Horses.* | | *Vehicles.* | |
|---|---|---|---|
| Riding .. .. .. .. .. | 37 | Ambulance waggons .. .. .. | 4 |
| Draught .. .. .. .. | 21 | Transport carts.. .. .. .. | 2 |
| Pack .. .. .. .. .. | 2 | Water-cart .. .. .. .. | 1 |
| | 60 | | 7 |

Each ambulance waggon has four horses and two drivers (artillery fashion), each transport cart two horses, and the water-cart one horse. Every soul in the Company is mounted, except the brakeman and waggon orderly of each ambulance, who are conveyed in their vehicles. Each packhorse (led) carries two jointed stretchers and two surgical cavalry bags; while each bearer wears a leather pouch containing a triangular bandage, and extra bandages are stored in the ambulance waggons. Every individual of the Company belongs to the Medical Corps, including the drivers and the horses; so it is absolutely self-contained. The uniform is khaki, with breeches, putties, jackspurs, and slouch hats, while the Geneva cross is worn on the sleeve.

Cooks, batmen, &c., are all available for duty in the field, so that up to thirty-two N.C.O.'s and men can be utilised as bearers if required. They work in sections of four, and all four bearers gallop up to a wounded man and dismount. No. 1 holds the horses, while the others attend to the patient, and carry him off if necessary. For this purpose they take a stretcher, either from a packhorse or from a waggon, acting in the manner laid down in the Manual for three bearers. As four men are needed to place the loaded stretcher into the ambulance, the waggon orderly joins the section for this purpose. With this exception (caused by No 1. holding the horses), all drill is done according to the Royal Army Medical Corps Manual. Of course, every man who is carrying a stretcher is on foot at the time.

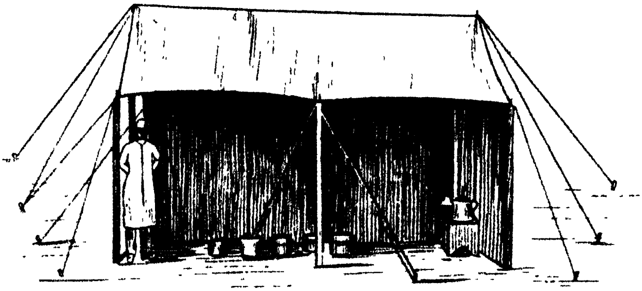
It will be seen, then, that the Company is mounted only to give it the extra mobility required for work with cavalry, and, as the waggons keep as close to the bearers as possible, no time is wasted by these men having to carry a patient a long distance on foot. I understand that this unit is going to be transformed into a Cavalry Field Ambulance.

## A CAMP KITCHEN TENT.

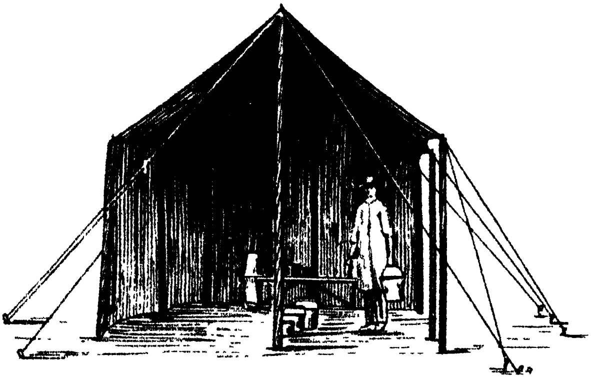
By Major S. F. CLARK.

*Royal Army Medical Corps.*

The Australian Army Medical Corps (New South Wales) has designed a kitchen tent which has been found very satisfactory. It does not add very much to the impedimenta that require transport, as it weighs only 1 cwt. 1 qr., while the whole of the canvas goes into one bag, and there is one bundle of poles. An ordinary kitchen is used within the tent, and the advantages to be gained by having the fire, and the cook and his utensils protected from heavy rain or boisterous winds are obvious.



A.A.M.C. Kitchen Tent. Front View.



A.A.M.C. Kitchen Tent. End View.

The tent has a roof, but only two walls—one at the end and one at the side. These walls may be erected, or changed, to suit the weather or direction of the wind, while the smoke, &c., escapes at the open sides, which also prevent any cramping of the movements of those employed in the kitchen.

The details are as follows: Length, 15 feet; width, 10 feet; height, centre, 11 feet; height, walls, 6 feet 6 inches; poles, 1 ridge, 2 centre, 6 wall, spiked at each end, or spiked at top and iron-shod at bottom; guy ropes, 8 double or 16 single; pins, mallets, &c.

The roof and walls are composed of No. 1 canvas, and have eyelet-holes for lacing.

Experiments were made with tents of all shapes and sizes, but the pattern described was found to be the best.

I must express my thanks to Major G. Lane-Mullins, A.A.M.C., who gave me these particulars and photographs, and who was kind enough to have one of the tents pitched for my inspection.

# Reports.

## SEWAGE DISPOSAL BY SLATE BEDS AT DEVIZES, WILTS.

By Major G. E. F. STAMMERS.

*Royal Army Medical Corps.*

The disposal of sewage is a matter which almost certainly has not yet reached finality, and new processes and modifications of existing ones are likely to occur. One of the later methods is that by means of slate beds, the invention of Mr. Dibdin, which, though bringing no new principles into being, differs from the usual treatment by septic tank and contact beds in that the slate beds take the part of the former. The whole process from start to finish is essentially aerobic, the anaerobic treatment in a septic tank being entirely done away with.

At Devizes, in Wiltshire, a town of some 6,500 inhabitants, much difficulty was experienced in the past in sewage disposal. The sewage to be treated is exceptionally strong and offensive, owing to the number of bacon factories, breweries, &c., in the town. The system in use up to recently consisted of chemical precipitation and pressing of the sludge; this was found to be expensive to carry out, and, moreover, it gave rise to considerable nuisance. After experimental trial it was decided to adopt Mr. Dibdin's slate beds, and the installation was completed and taken into use in September, 1905, since which date the whole of the sewage has been thus treated, with a considerable reduction in the working expenses and a total absence of nuisance.

The method consists of contact in primary (slate) beds, followed by secondary (coke breeze) beds and final irrigation on grass land. A general view of the installation is given in fig. 1.

The amount of sewage treated is normally some 250,000 gallons daily, but owing to the drainage system being combined surface and foul this amount is largely increased in wet weather.

*Primary Slate Beds.*—Of these there are eight to take the normal flow, and two additional which are brought into use for storm-water. The dimensions of the two storm-water beds are each 80 feet by 68 feet, with a depth of 4 feet of slate slabs. The remaining eight beds are smaller, being each 68 feet by 45 feet, but with the same depth of slate. The manner in which these beds are packed with slates may best be understood from fig. 2.

Fig. 1.

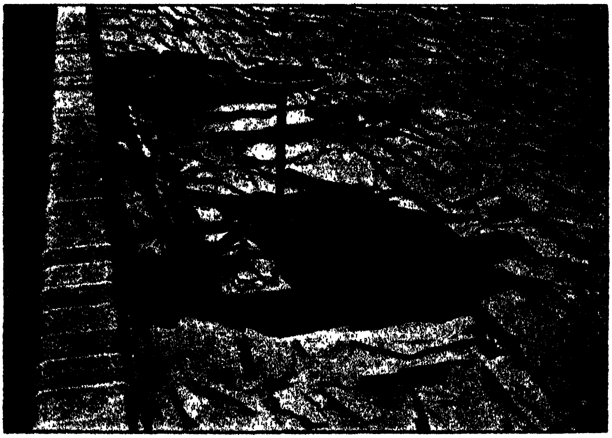


Fig. 2.

At the bottom of each bed a clear space of 6 inches is left; above this are arranged the slate slabs in layers, the layers being kept some 2 inches apart by means of distance pieces. The slates are not of regular size, but average about 1 foot 6 inches by 6 or 9 inches, and $\frac{1}{4}$ inch or so thick. Cylindrical orifices are left in the material at regular intervals, into which a hose can be introduced and any deposit swilled out on to a drying bed to finally weather. The sewage is admitted direct from the carrier on to the surface of the slates, as seen in fig. 3, any solids which remain on the surface being swept up periodically and removed.

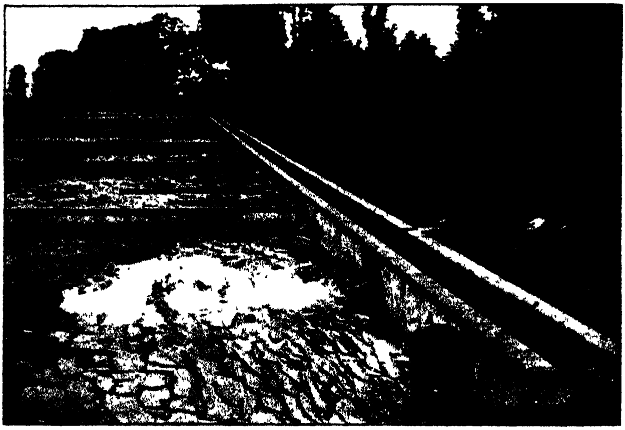


FIG. 3.

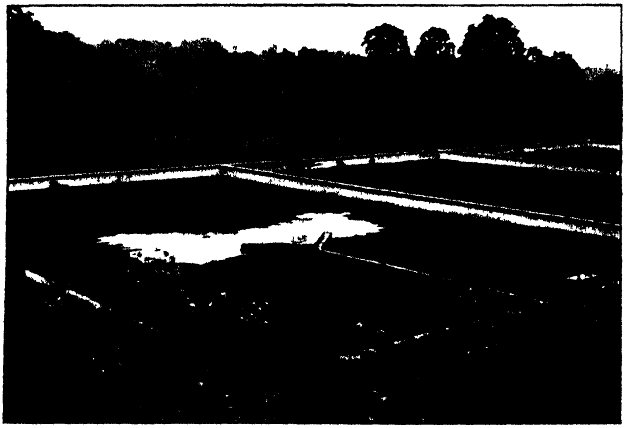


FIG. 4.

Under normal conditions the sewage is not screened or passed through a grit chamber before admission to the slate beds, but in the event of rain it is passed through a grit chamber as a preliminary, this course being necessary on account of the large amount of road detritus, &c., brought down after rain. The average detail of working for the smaller size of bed is—two to three hours to fill, two hours of contact, two to three hours to empty. All work is regulated by hand, no automatic gear being installed.

The above constitutes the primary treatment by the slate beds, and it is evident that the process is essentially aerobic.

*Secondary Coke Breeze Beds.*—These are eight in number, and of the same dimensions and depth of material as the smaller of the slate beds. The material is the size of a closed fist at the bottom close to the underdrains, the remainder being graduated from ½ to ⅛ inch. After contact in the slate beds the sewage is admitted in a most simple manner on to the surface of the fine beds, as may be seen from fig. 4. The top layer of the fine beds is turned over and broken up to the depth of about a foot or 15 inches every ten days on an average. The times of filling, contact, &c., are approximately the same for the fine as for the slate beds.

The effluent is subsequently passed over grass land and ultimately gains access to a brook.

*Results.*—The installation has now been in continuous use for over three years, and during that time has caused no trouble and has worked efficiently. In installations where a septic tank is employed one always seems to have trouble and expense with sludge, and not infrequently it passes on to the contact beds or filters and causes clogging and inefficient action. At Devizes it is understood that there has been no trouble from this cause, and beyond the regular breaking up of the top layers of the secondary beds they have never needed touching. This is undoubtedly largely due to the practice of not allowing the last portion, practically consisting of humus, from the primary beds to pass on to the secondary; it is, instead, passed on to a drying-ground; here the solids are allowed to weather, and they soon become friable and quite inoffensive.

In the primary beds, after three years use, there is only a deposit of an average of 2 inches deep at the bottom; this formed a few months after commencing work and has not increased since. Any accumulation of solids between the layers of slates can be washed away by means of a hose introduced into the orifices left for the purpose, but this has not been found necessary up to the present time. This deposit is found not to be offensive.

The character of the effluent is satisfactory after treatment in the primary and secondary beds; in appearance it is usually a pale yellow colour, opalescent, and has some brown sediment. The results of analyses naturally vary, but 80 per cent. of purification may be attained taking the albuminoid ammonia figure as the indication. After the primary beds only, the sewage is usually yellow, thick and turbid, with a brown sediment, and on an average shows a purification of from 25 to 30 per cent.: that is to say, about the same purification as may be expected from a septic tank.

The initial cost of an installation of this type would necessarily be heavier than one on the septic tank system, as more primary slate beds are needed to allow of a proper cycle and adequate aeration. At Devizes it is understood that the annual expenses have decreased from £700 per annum (which was the cost of the chemical precipitation and sludge-pressing process) to £200 per annum, so in this case the indication is that any extra capital charge will soon be met by saving on working expenses.

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# Echoes from the Past.

## THE CARE OF THE SICK AND WOUNDED DURING MARLBOROUGH'S CAMPAIGNS.

By Major H. A. L. HOWELL.
*Royal Army Medical Corps.*

[The writer contributed to early numbers of the Journal of the Royal Army Medical Corps a series of papers dealing with the care of the sick and wounded, and the history of the Army surgeon in British campaigns from the earliest times down to the end of the Great Civil War. Owing to difficulty in obtaining some material necessary to complete his notes on the period between the end of the Great Civil War and the reign of Queen Anne, he proposes in this article to deal with Marlborough's campaigns, returning on some future occasion to fill up the gap in the continuous account of what may be termed the historical evolution of the Royal Army Medical Corps.]

### Marlborough's Campaigns.

Soon after Queen Anne ascended the throne the increasing power of Louis XIV., and the aggressive policy which aimed at making France the controlling power in Europe, forced England, Holland and the Empire to enter into a coalition to contest the French ambitions in the field. This war, the War of the Spanish Succession, lasted from 1702 to the Peace of Utrecht in 1713. On one side were the allies, English, Danes, Dutch and Austrians, on the other the French, Spanish, and Bavarians.

The population of England was, at this time, about ten millions, that of France twenty or more. England was never able to put in the field during the war more than 40,000 men, and this only after extraordinary exertions. It was even found necessary for an Act to be passed empowering justices of the peace to impress men for service in the Army. These "pressed" men were chiefly vagrants, men who were not entitled to vote, and members of the criminal classes. The only physical standard laid down was that no recruit should be under 5 feet 5 inches in height. The first official document in which any disease is mentioned as a disability for military service is the Act of 1745. This directed that no men should be pressed but "able-bodied men, free from rupture and every other distemper or infirmity, that may render them unfit for duty." It does not, however, appear that any medical evidence of the recruit's disability was required.

In Queen Anne's reign "all officers and soldiers, of what quality soever," were required to take this oath: "I swear to be true to our Sovereign Queen Anne, and to serve her honestly and faithfully, in the defence of her person, crown and dignity, against all her enemies and opposers whatsoever, and to observe or obey Her Majesty's orders, and the orders of the generals and officers set over me by Her Majesty. So help me God." Pressed men did not take the oath, but we find that, in 1744, on enlistment, the Articles of War against mutiny and desertion were directed to be read to them, after which they became subject to military discipline. With regard to the recruiting of the medical department of the Army at this time we know very little. We know that during Charles II.'s reign the Company of Surgeons of London—now the Royal College of Surgeons—controlled to some extent the supply of surgeons for the Army and examined them before they entered the Service, but there is, I believe, no evidence that they continued their services after Charles II.'s time.

Each cavalry regiment had a surgeon, and each regiment of foot a surgeon and a surgeon's mate. The cavalry surgeon received for himself and his horse six shillings a day; the surgeon of foot four shillings, and his mate half-a-crown. I think it probable that the original commissions were obtained through the influence of the colonels of regiments. We know that at this time regiments were raised by the Crown contracting with men of position or well-known soldiers to raise the number of men required, bounty money per head being granted for the purpose. Often the officers of the newly raised corps paid for their rank in the corps—the beginning of the "purchase system," which lasted till our own times. Surgeons' commissions were therefore either purchased or obtained through influence. At this period we occasionally find surgeons holding double commissions as surgeon and also as combatant officer. As they attained promotion to higher rank the surgeon's commission was given up. This custom was abolished as late as 1796. At this period there was no "Geneva Convention" to protect the surgeon as a non-combatant, and as the surgeon's duties on the field only began after the fighting was over, the double commission was not so incongruous at the time as it appears to us now. The Army also had its physicians, but these were attached to hospitals or to the staff. The physician on Marlborough's staff received ten shillings a day. Peterborough's staff physician in Spain, in 1707, received the same pay. On the staff of the Home Establishment in 1717 were a physician-general, a surgeon-general, and an apothecary-general. They also received ten shillings a day as pay. I believe that there were attached to the hospitals apothecaries also, but there is only indirect evidence of this. There was a regulation that all surgeons *and apothecaries* were required to fit up their chests at the Apothecaries' Hall, and they were to be examined and certified by the Master and Wardens of the Apothecaries' Company, and the Physician or Surgeon-General of the Army.

Marlborough, in his dispatches, on several occasions refers to the "Director of Hospitals" in such a way that one can only infer that there was a person of rank who occupied this position. This may have been a medical officer or may not, but at any rate, it shows that there was some attempt at medical organization in the field and that there was a personage who carried out the duties of Principal Medical Officer directing the hospitals.

As to Marlborough's hospitals, they appear to have been established in public buildings in the towns. In a populous country like Belgium, where most of the fighting took place, the wounded appear to have been sent back to the nearest fortified town and there provided for. Occasionally we find him establishing a camp hospital, the wounded, as after Blenheim, being placed under shelter in the tents captured from the enemy. Cust says: "It was a great characteristic of Marlborough that he was always most thoughtful for the wounded; and it is believed that owing to his example camp hospitals were first established." Cust is not quite correct when he says that camp hospitals were first established in Marlborough's campaigns. It may be that they then were, for the first time, recognised as absolutely necessary, and were a usual accompaniment to his armies, but, as I have elsewhere shown, the earliest instance of a field hospital was that established by Queen Isabella of Spain, at Antequera, in 1484, when she fitted up six large tents with beds and medical equipment for the reception of the sick in her army. Henry IV. of France, in 1597, made similar arrangements at the Siege of Amiens.

When no large buildings were available for use as hospitals, the sick and wounded were billeted upon the nearest towns and villages. Marlborough's commissariat arrangements appear to have been well directed. The means by which he replenished his medical and surgical stores are not known, but each surgeon, physician, and apothecary had his "chest" fitted up in accordance with regulation, and under the supervision of the Apothecaries' Company and the heads of the Medical Staff in England. In addition, after 1702, each soldier paid one day's pay annually towards the upkeep of the hospitals. In 1710, by an Act of Parliament (9 Anne, c. 8), the provision of medicines for the Army was approved of, "to the end that Her Majesty's Forces might be supplied with good and wholesome medicines, internal and external, and for preventing the loss and suffering of many officers and soldiers for want thereof." By "The Articles of War for the Forces beyond Seas" during the reign of Queen Anne, plunder of the enemy was strictly forbidden until after the enemy had been beaten. The plunderer was liable to suffer death, or such punishment as a court-martial should pronounce against him, and "the pillage so gotten shall be forfeited for the use of the sick and maimed soldiers." It was further directed that one-tenth part of all spoil should be "laid apart towards the relief of the sick and maimed soldiers." Later "Articles of War" laid down that every soldier neglecting to attend Divine Service and sermon should become liable to a fine of twelve pence; which sum was applied to the use of the sick soldiers of his troop or company. Marshall says this was in force as late as 1846.

There does not appear to have been any organized transport for the conveyance of the sick and wounded, but we know that country carts were utilised for this purpose, and in Holland and Belgium canal and river transport was largely used.

When Dutch or Austrian sick and wounded were treated in our hospitals, or *vice versâ*, the cost of their maintenance was estimated and charged against the nation concerned. Some of Marlborough's dispatches deal with this matter.

We now have a general idea of the Army of Marlborough and of its medical arrangements, and may pass on to consider the work actually done in the field during his campaigns.

It should be remembered that at this period it was not the custom to fight in winter time. War began in the spring and lasted until the beginning of winter, when the troops on each side retired into winter quarters and were billeted on the inhabitants of the towns and villages.

In July, 1702, the Army of the Allies concentrated at Nimeguen and Marlborough took command. The campaign was one of marches and sieges. Marlborough never failed to capture any town he besieged, and never lost a battle. Venloo was taken by assault in September, and Liége in November. During these operations Maestricht was the base, and from thence bread and foodstuffs were obtained for the army and to that place serious cases of illness and wounds were sent. In the following year the British troops were not called upon to take part in any very active warfare. It would appear that in the autumn there was a great deal of sickness among them, one regiment, at Bergen-op-Zoom, having 150 men on the sick list at one time.

In 1704, Marlborough decided to carry the war across the Rhine into Bavaria. On May 19th he began his great march of 600 miles to the Danube. This march was perfectly carried out in all its arrangements. Commissaries preceded the troops, selected the camp-sites, and collected local transport and food, so that, as an eye-witness says, on arrival in camp, at the end of the day's march, "the soldiers had nothing to do but to pitch their tents, boil their kettles, and lie down to rest." The troops marched daily at 3 a.m., and after travelling 4 to 4½ leagues usually reached camp at 9 a.m. After three or four days marching the army halted for a day. On July 22nd they found the entrenched camp of the Franco-Bavarian Army in a strong position at Donauwörth (or Schellenberg). A bloody battle ensued, which ended in a complete defeat for the Elector of Bavaria. The Allies found themselves victors that night, but with 4,000 wounded and 1,500 dead at their feet. The weather was very wet and this greatly aggravated the condition of the wounded. Marlborough, foreseeing that the Franco-Bavarian camp could not be taken without great bloodshed, had given orders for the establishment of a Grand Hospital at Nordlingen, and desired that particular attention might be paid to the sufferers. Leaving the wounded and a garrison at Schellenberg, Marlborough and his army pushed on into Bavaria. The Grand Hospital at Nordlingen was very crowded, and Marlborough gave orders to the Director of Hospitals that, as the sick and wounded became convalescent, they were to be billeted on the neighbouring villages and towns. Nordlingen was also used as a commissariat depôt from which bread-stuffs were sent after the Army. On

August 11th Marlborough was joined by Prince Eugene and his army (Austrian), and this brought the strength of the Allies up to 52,000 men, with fifty-two guns. The French Army numbered 57,000 of all arms. On August 13th the Battle of Blenheim was fought. The battle was fought with much determination on both sides, but Marlborough's consummate generalship led to a complete victory for the Allies. In the attack on Blenheim, Cutts' English Brigade marched until they could touch the palisades without firing a shot. At such close quarters the French fire told severely, and the Brigade lost one-third its numbers in killed and wounded in a few minutes. Previous to the battle, after prayers had been said in front of each regiment, Marlborough "pointed out to the surgeons the proper posts for the care of the wounded." After the battle the surgeons found that they had 8,000 wounded to attend to. The Allies had also lost 6,000 killed. The French loss in killed, wounded, prisoners, and missing amounted to 40,000. They fled through Ulm and carried with them 7,000 wounded, of whom 1,000 were officers. The French prisoners, and those of their wounded left on the field, were sent to the villages in the rear of the Allies under guards of cavalry. The French camp, well supplied with food, had been left standing. The sick and wounded were at first placed under shelter in these tents, and next day, Parker says, "all our wounded were sent to Nordlingen, where our Grand Hospital was fixed." Four days after the battle Marlborough, in a letter to Godolphin, says, "Ever since the battle I have been so employed about our own wounded men and prisoners that I have not had one hour's quiet." Some of the wounded remained at Nordlingen until October, for in that month Marlborough wrote to the magistrates of the town thanking them for their attention to the wounded, and promised to get them removed quickly. Ultimately the English and Dutch wounded and the French prisoners were conveyed to Mayence, and thence down the Rhine in boats to Holland. In the late autumn the troops marched back towards Holland and went into winter quarters, having marched 1,176 miles, fought two great battles, and taken several towns since the beginning of the campaign in May.

After the triumphant campaign of Blenheim, Marlborough and Eugene had hoped, in their next campaign, to be sufficiently reinforced to attack France by way of the Rhine and the Moselle. The Allied Powers, however, did not rise to the occasion, and June, 1705, came before any movement was made. The English Parliament had only provided for an army of 40,000 for the year.

The French, however, by great exertions, rapidly recovered from the effects of the disastrous campaign of 1704, and were soon again in the field, and in superior strength. Villeroi, the French Marshal, marched rapidly with an army against Holland, took Huy and the town of Liége, and laid siege to the citadel of the latter place. Marlborough at once made a night march to the rear in order to avoid the French, and hoped to unite with the Dutch Army at Maestricht in time to surprise Villeroi. Villeroi, however, heard he was coming and fell back to his fortified camp on the Meuse. Huy was retaken by the Allies. The French position was so strongly held and so strongly fortified as to be considered impregnable. Marlborough, however, by skilful manœuvring, weakened the French centre and, by a night march, pierced it, and attacked the French, who fell back into a position at right angles to their old alignment. Marlborough, owing to the failure of the Dutch to support him, was unable to pursue his advantage. In August, however, he managed to interpose between the French and France The French were at Waterloo, in some confusion, but the Dutch again refused to attack, and the commissariat failing, the Allies had to fall back to their old camp. In October the troops went into winter quarters.

In May, 1706, the Allies again took the field with 60,000 men, and, on May 22nd, attacked the French Army of 62,000 men at Ramillies. The fighting was at close quarters and of desperate character; but Marlborough's arms were again triumphant. The French lost 7,000 men killed and wounded, 6,000 prisoners, fifty-two guns, and the whole of their baggage. The Allies lost 1,066 killed and 2,867 wounded. The relative figures of killed and wounded show how fiercely the battle was contested. Little short of 8,000 French and Allied wounded lay on the field to the care of the surgeons. Coxe says that, by Marlborough's orders, the wounded of both sides received equal attention and were lodged in hospitals. Apparently, the French tents were utilised as shelter for the wounded.

The consternation produced by this single battle led to the surrender, without fighting, of all the fortified towns in Belgium, with the exception of Ostend, Dunkirk, and two or three smaller places.

In July, Ostend was taken with a loss of 500 men; in August, the strong fortress of Menin fell, but only after a stout resistance, which cost the Allies, of whom the English, who led the storm, suffered most, 1,400 men. After taking Dendermonde and Ath, and vainly endeavouring to tempt into action Vendôme's strong French army, which had been rapidly collected together to protect the frontier of France, in October Marlborough's army went into winter quarters.

The year 1707 was wasted in marches and counter-marches. Marlborough's skilful manœuvres placed him several time in favourable positions to attack the French, but the Dutch refusing to fight, he had to see his plans wasted. The French were successful on the Rhine and ravaged the Palatinate, and the English Army in Spain met with terrible disaster at Almanza. In October the troops went into winter quarters.

In May, 1708, Marlborough again took the field, and was opposed by Vendôme with 100,000 men. Vendôme, by rapid night marching, took Ghent and Bruges, and was thus in a position in the middle of Marlborough's water communications. If he were able to maintain his position the Allied Army would be obliged to fall back on Antwerp and the line of the Scheldt, and Brabant and Flanders would fall into the hands of the French. Marlborough's base hospital was at Ghent, and when Vendôme took the town the inmates of the hospital and the medical staff were taken prisoners. Vendôme, however, wrote to Marlborough and offered to hand over the sick and wounded. Marlborough, thereupon, sent by river transport 150 French wounded prisoners, then in our hospitals at Brussels, to Ghent, and the boats took back with them to Brussels our sick and wounded. I can find no record of the fate of our medical staff at Ghent.

From 1705 until the end of the war, Ghent appears to have been specially connected with the British part of the Allied Army Their base hospital was at Ghent, and they usually retired to that town at the end of each campaign, to take up their winter quarters there. It is probable that from Ghent to Ostend, and thence by sea to England, was the usual way of sending invalids to England. Marlborough contrived to throw an English force into Oudenarde before the French commenced to besiege it. Marlborough was greatly disheartened at the fall of Ghent and Bruges, and the interference with his water communications, on which he mainly relied for getting up his provisions and military stores, and by which he sent back his sick and wounded to his rear. He fell into a fever, but would not obey his physician and retire to Brussels. Prince Eugene arrived on July 7th, and an immediate attack on Vendôme was decided upon. On July 9th the Allied Army pushed across the French line of communications, and, after much manœuvring, on July 11th was fought the Battle of Oudenarde. The French numbered 85,000 men, the Allies 80,000. The battle did not begin until the afternoon and was continued until late at night. The French lost 6,000 killed and wounded, 9,000 prisoners, and 100 standards. Marlborough said that "if he had had two hours more of daylight the French Army would have been irretrievably routed, a great part of it killed and taken, and the war terminated on that day." The Allied loss amounted to 5,000 men. A prodigious number of wounded lay all around on the field, and at break of day Marlborough visited the field, arranged for the collection of the wounded, and directed that all, without distinction between friend and foe, should receive equal attention at the hands of his surgeons. It was a busy day for the Allied surgeons. The French still held Ghent and Bruges, so that the Allied communications had to be made by land, and this entailed additional suffering on those wounded who had to be transferred to the base in Holland. Vendôme was, soon after Oudenarde, joined by the French Army of the Moselle, and this brought his members again to 100,000 men. Eugene's army did not join Marlborough until August 12th, and brought with them provisions and war stores from Maestricht and Brussels. It is said that the convoy consisted of 16,000 horses, and covered 15 miles of road. These would have been unnecessary had the water-ways been open. It was arranged that Eugene should besiege the town of Lille, in French Flanders, while Marlborough's army watched Vendôme. Marshal Boufflers defended Lille with 15,000 men. In September, General Webb and 10,000 English fought their way with a convoy from Ostend to Lille, defeating the French at Wynendale. After a siege of sixty days, Boufflers surrendered the town, but the citadel held out for six weeks longer. The Allies lost 17,000 killed and wounded, and the French 5,000 during the siege. The French wounded were sent to Douay.

During the siege at Lille there was at times a scarcity of provisions and also of ammunition. The French had cut the dykes and flooded a great deal of the country. Supplies were, however, got through from Ostend by boat, and by waggons mounted on high wheels. Convoys were also sent round by land from Brussels, and to Brussels many of the wounded were sent. The distance from Brussels to Lille was 25 leagues. It is remarkable how rapidly Marlborough gathered together and organised the immense transport rendered necessary by the sudden loss of his water communications; and this in the middle of the campaign. The citadel of

Lille fell on December 11th. The French then went into winter quarters, but Marlborough suddenly laid siege to Ghent, which was defended by 18,000 men. On January 2nd Ghent fell, and the French were allowed to march away with the honours of war. During these campaigns Ghent was usually the headquarters of the British troops during the winter. The retaking of Bruges completed the campaign.

In 1709, Marshal Villars took command of the French Army, now raised to 112,000 men. Marlborough's Allied Army numbered 110,000 men. The British contingent received a reinforcement of 10,000 men.

Before commencing the siege of Tournay, Marlborough wrote to the magistrates of Lille and arranged for the setting aside of a commodious building for use as a hospital, and asked them to give the officers of the hospital every assistance in carrying out their duties. This hospital was probably for the use of the garrison of Lille, for Tournay, being on the Scheldt, was connected more directly with Ghent, to which place the sick and wounded were easily taken by boat.

On July 12th the Allies laid siege to Tournay. Mining and counter-mining were great features of the siege. On one occasion, 150 of the besiegers were blown up by the explosion of a mine; on another occasion 300 men met with the same fate. On July 29th the town was taken, but the citadel did not fall until September 3rd. By rapid marching (forty-nine English miles in thirty-six consecutive hours) the French lines were turned and Mons besieged. Villars, with 95,000 men, took up a position at Malplaquet and fortified it. On September 11th Marlborough and Eugene, with 93,000 men, attacked him. The troops were under arms at 3 a.m., and, after prayers, took up their positions.

The battle which followed lasted nearly the whole day. The fighting was of a most determined character. First aid was given to the wounded by the surgeons on the field, and many, after being attended to, were seen returning to the scene of combat, "pale and bleeding, to take again their places in the ranks and support their gallant comrades." At length the entrenchments were carried and the French driven from the field. Villars had been wounded above the knee, but Boufflers drew off the French in good order. Owing to exhaustion, the pursuit was only for a short distance, and the Allies bivouacked on the field of battle. The Allied loss amounted to 18,250 killed and wounded; the French, who had the advantage in position, lost 14,000 men. The number of wounded was so large that Marlborough wrote to the French marshals asking that arrangements might be made between General Cadogan and a French representative for the burial of the dead and the removal of the wounded. It took two days to bury the dead and collect 3,000 French wounded who lay concealed in the surrounding woods. Wounded French officers were released on parole and soldiers considered as prisoners of war until exchanged.

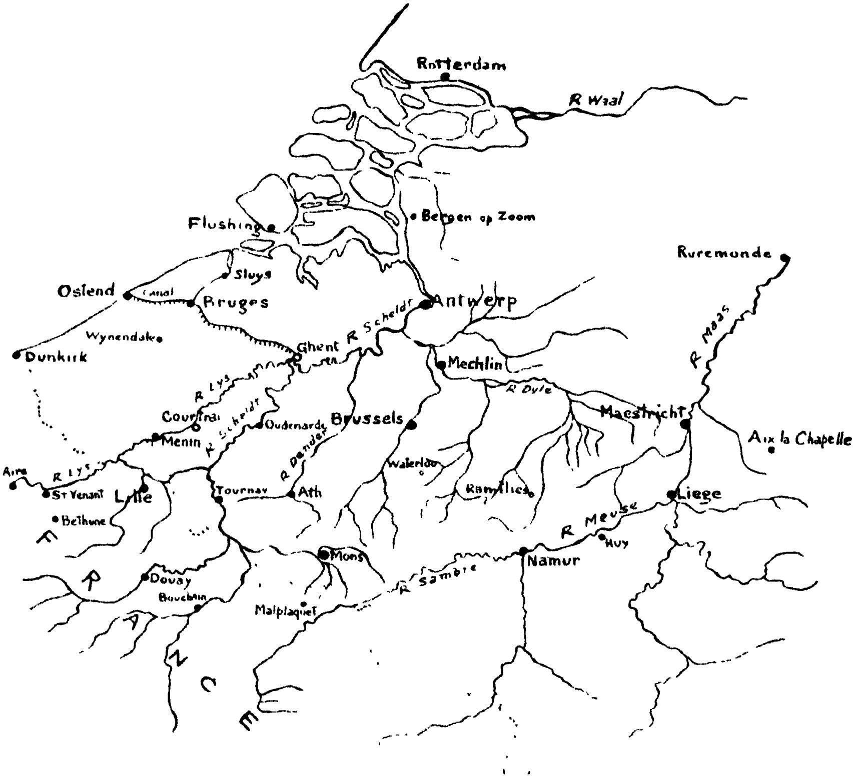
After Malplaquet the Allies resumed the siege of Mons. The ground around Mons was very swampy and the weather bad, so that there was soon a great deal of sickness in the Allied camp. There is in the *Tatler*, No. 89, October 29th, 1709, a letter from a serjeant of the Guards, from the Camp before Mons, in which he refers to comrades in the camp hospital there. Hospitals were therefore established close to the fighting line during the siege, or were established as soon as the siege was over, for Mons fell on October 20th, nine days before the serjeant's letter was written. The weather now became so inclement that both armies retired into winter quarters, the English, as usual, going to Ghent. So much difficulty was experienced at this time in getting recruits to make good the losses of these campaigns that a short service system, enlistment for three years, was tried. At the end of the three years an endeavour was made to force the men to continue to serve, but without success, and so the experiment was not continued after 1711.

In April, 1710, the campaign reopened, 60,000 men, under Marlborough and Eugene, assembling at Tournay. In the face of a French army larger than their own the Allies laid siege to Douay. Douay was taken on May 26th. Bethune was taken, with a French force of 9,000 men, on August 28th. Marlborough, owing to political intrigues at home, lost the confidence of the Government and was not properly supported. The result was that he was unable to get the Dutch bankers to advance the necessary money for his supplies and for his men's pay. There were numerous desertions, and sickness also made sad havoc in the ranks. The season was very rainy and the troops constantly exposed. The French also were very successful in cutting off a large convoy of guns and ammunition and in preventing the operations of Marlborough's foragers. St. Venant and Aire were taken, and then Marlborough went into winter quarters. His losses in killed and wounded, to say nothing of those due to sickness and desertion, amounted to 7,000 men during this campaign.

The campaign of the following year was similar in character.

Villars was very successful in cutting off Marlborough's convoys and also in an attack on his camp at Douay, where the Allies lost 200 men. In June, the Allies had been reduced in numbers by the removal of 30,000 Austrians to Germany. Marlborough, however, by skilful manœuvring took the French lines without firing a shot and laid siege to Bouchain. Bouchain fell on September 14th.

This was Marlborough's last campaign. In the following year the British Government made a separate treaty with the French, and the British troops, now commanded by the Earl of Ormonde, withdrew from the Allies. The French quickly recaptured many of their lost towns, and peace was soon afterwards proclaimed.



Of the English regiments which fought in these campaigns (the surgeons of which formed the greater part of the English medical staff employed), the Coldstream Guards were at Oudenarde and

Malplaquet only; the 28th and 29th at Ramillies only; and the 1st, 3rd, 5th, 6th and 7th Dragoon Guards, the 2nd Dragoons, the 5th Lancers, the Grenadier Guards, and the 1st, 3rd, 8th, 10th, 15th, 16th, 18th, 21st, 23rd, 24th, 25th, 26th and 37th Regiments of the line bear on their colours the four great victories of Blenheim, Ramillies, Oudenarde and Malplaquet. Some other regiments which afterwards were disbanded took part in the campaigns.

It is remarkable that during this war no Army medical officer attained sufficient prominence to be remarked above his fellows. It is related, however, that on one occasion Marlborough promoted a surgeon to the rank of physician, probably in order to get him the higher rate of pay.

Although such a large number of books have been written on Marlborough and his campaigns, it is surprising what little mention is made of Marlborough's medical arrangements, although several writers refer in glowing terms to his solicitude for the care of his sick and wounded. It is evident, however, that a carefully thought-out organisation for medical relief, for camp hygiene, and for commissariat existed, and that the details were always under Marlborough's own direct supervision. His correspondence shows this.

## Reviews.

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POINTS OF PRACTICE IN MALADIES OF THE HEART. By Sir James Sawyer, M D., F.R.C.P.Lond., Consulting Physician, Queen's Hospital, Birmingham. Pp. 96. London: Cornish Brothers, 1908.

This small book does not claim to be an exhaustive study of heart affections. Among some of the points which deserve attention may be mentioned the significance of transitory systolic mitral and aortic bruits. These are of functional origin: "souffles de consultation." They are not persistent, even during the period of auscultation. This character is sufficient to distinguish the mitral murmur from that of valve disease, which never becomes inaudible, according to the author. Moreover, the functional bruit accompanies, and does not displace, the first sound at the apex.

On the subject of treatment he notes the benefit which sometimes follows the discontinuance of cardiac remedies and the substitution of Gregory's powder, soda and calumba, in their place. He recommends the use of digitalis when the veins are too full and the arteries are not full enough, and when the pulse is soft. He relates a case which recovered after phlebotomy, though *in extremis* from cardiac dilatation. Also another, of mitral regurgitation, free from symptoms for forty years.

C. B.

DEATH AND ITS VERIFICATION. By J. Brindley James, L.R.C.P.I., M.R.C.S.Eng., Examining Physician-in-Chief and Vice-President of the Association for the Prevention of Premature Burial. Pp. 56. London: Rebman Limited, 1908. Price 1s.

We regret to see that a member of the medical profession has lent himself to exploit a groundless and insubstantial popular fear, often in evidence in the halfpennny evening press. The statement which the author makes, that the danger of premature burial is a very grave one, is untrue. British practitioners do not require the assistance of the "Examiner-in-Chief of the Association for the Prevention of Premature Burial" to assist them in determining whether life be present or not, at such time after death as interment takes place in this country.

C. B.

SPRUE AND ITS TREATMENT. By W. Carnegie Brown, M.D. Quarto, pp. xiii. and 259. London: John Bale, Sons and Danielsson, Ltd. 6s. net.

Of the biblia abiblia which form the literature of our profession, several classes exist. There are those which embody the results of original observation and research; those which, in the language of the street preacher, convey a message; and those whose aim appears to be the presentation of a considerable number of pages in a nicely bound volume, with the author's name in gold on the cover. First impressions of the book under review suggest that it belongs to this class, often useful, though not otherwise remarkable. Closer acquaintance, however, shows this impression to be erroneous; it appears rather to be a labour of love, the result of a slow process of accretion in which different periods may be detected.

This volume consists of 247 pages of text, of which 137 are devoted to treatment. In dealing with a disease in which the results are so often unsatisfactory, it is useful to have detailed, even if diffuse, account of various methods. The author, indeed, disarms criticism by pointing out in his preface that he must necessarily state the "possible dietetic measures in the Tropics as well as at home."

The earlier portion of the work is largely occupied by an historical retrospect, and a rather confused account of various theories of the etiology of sprue and its relation to other intestinal diseases. Here the stratification referred to above is most obvious. The author recognises two forms of dysentery, amœbic and bacillary, but does not appear to recognise the association of hepatic abscess with the former rather than the latter type. He appears to consider the prevalence of hepatic abscess is indicative, not of a difference in the etiology of the antecedent dysentery, but only of a difference in its severity.

The clinical course, pathology, and diagnosis are described fully again with much matter which is mainly of historical interest. This portion is of very unequal value, and might with advantage have been compressed.

R. J. S.

CLINICAL METHODS: A GUIDE TO THE PRACTICAL STUDY OF MEDICINE. By Robert Hutcheson, M.D., F.R.C.P., and Harry Rainy, M.A., F.R.C.P.Edin. Cassell and Company, Ltd. Price 10s. 6d.

The present volume, recently published, is the fourth edition of Hutcheson's and Rainy's well-known "Clinical Methods."

In the issue of this edition the authors have taken the opportunity of revising the text and omitting description of methods now out of date. The total number of coloured plates is slightly increased, and the assistance of Professor D. J. Cunningham has been obtained for the preparation of the excellent plates illustrating the topography of the abdomen and thorax.

Presumably owing to the increased importance of bacteriology in all branches of medical practice, the assistance of Professor Ritchie has been similarly enlisted in the preparation of the section devoted to that subject, which includes a brief description of "opsonic technique." The present volume more than maintains the high standard of its predecessors, and, of its class, is the best small book with which the writer is acquainted. It should prove particularly useful to officers in the Services. O. R.

VENOMS, VENOMOUS ANIMALS, AND ANTI VENOMOUS SERUM THERAPEUTICS. By A. Calmette, translated by Ernest E. Austen. Pp. 403. London: John Bale, Sons and Danielsson, Ltd., 1908. Price 15s. net.

This book is a translation of the work of Calmette, whose labours in the field of anti-venomous serum therapy lend great interest to its appearance. The work commences with general notes on poisonous animals, followed by a classified description of all the principal venomous snakes; this is very copiously illustrated, and forms a valuable source of reference for the identification of poisonous and other snakes. After this come accounts of the physiological action of snake venoms, methods of collecting venom, and the technique of anti venomous serum therapy. M. Calmette still holds to the view that the neurotoxin is the essentially active substance in venoms, and that "the *neurotoxic* substance is *one and the same*, and always neutralisable by an *anti-neurotoxic* serum like that of animals vaccinated against cobra venom." The italics are in the book under review, and the only reference to the work of Tidswell, Lamb, and others on the specificity of snake venoms consists in a footnote, giving a list of articles whose purport is not mentioned either in the text or in the footnote. This is a somewhat cavalier method of dealing with opinions differing from one's own, and when it concerns a point so fundamental as the specificity of snake venoms its effect is to almost totally destroy the value of this part of the work as a guide to those concerned in the preparation of anti-venmes, and to those whose duty it is to administer the anti-sera to patients.

On the next page (251) the author "hedges" somewhat, and recommends that for countries where viperidæ are common, one should not confine oneself to vaccinating the animals that produce the serum with the *neurotoxin* of cobra venom, but should also, after immunising them against cobra venom, prepare the animals by progressive doses of the various venoms derived from snakes most common in the district, and he states that nothing is easier than to train animals vaccinated against cobra venom to tolerate strong doses of the venom of *Lachesis*, *Vipera russellii*, *Crotalus*, *Hoplocephalus*, or *Pseudechis*. This is not our experience, at any rate, so far as immunisation against Russell's viper venom is concerned; with this poison very special precautions are necessary if one wishes to keep within limits the otherwise perfectly appalling sloughing which results from inoculation of quite small doses into horses.

The further chapters give a description of other venomous animals, with the symptoms produced by their bite or sting; and the book concludes with a recital of a number of cases of snake-bite which have been treated by Calmette's anti-serum. Some of these latter, it must be confessed, leave one very unconvinced when they concern the treatment of bites by snakes other than cobra.

The book is well got up, copiously illustrated, very readable, and full of interesting details, all of which make one regret the more that M. Calmette did not see fit to enter more fully into his reasons for rejecting the work of those who differ from him on the specificity question, which lies at the root of the whole matter.

W. S. H.

TROPICAL MEDICINE, HYGIENE, AND PARASITOLOGY. By Gilbert E. Brooke, M.A., L.R.C.P. Pp. 498. London: Charles Griffin and Co., 1908. Price 12s. 6d. net.

The purpose of this handbook is to fulfil the demand of Colonial medical men for a library "small, but complete," and "that the ever-increasing mass of clinical observation and specialised literature should be presented to them in a handy and portable form." The idea is excellent, and the amount of information which has been squeezed into the space of the book is remarkable. It is, however, to be regretted that some of the matter is not by any means up to date, and in places is inaccurate.

In Section 1.—Hygiene of the Tropics—there are good chapters on Food, Exercise, and Clothing; the Hygiene of the Mouth; and Pregnancy and Infant Feeding.

It may be noted that the author is an advocate of the actinic-ray theory, and advises that clothes and hats be lined with red or orange. No mention is made of the good effects of vaccine treatment in pyorrhœa alveolaris.

In Section II.—Medico-Biology—animal and vegetable parasites, mosquitoes, fleas, ticks, and snake-bites are dealt with. One chapter (VII.) is devoted to the classification of vegetable parasites, and to brief descriptions of the chief pathogenic species of bacteria. Here we are told that the gonococcus and the *Micrococcus melitensis* are "slightly motile," though with regard to the latter the author corrects himself in the chapter on Malta fever; and it seems rather premature to describe "streptococcus" as a "special agent of scarlatina." The classification is rather elaborate for a work of this kind. For instance, Bacteriaceæ (rod forms) are divided into four genera: (1) Bacteria (no spore formation); (2) Bacillus (spore formation); (3) Spirillum (spiral form, no spores); (4) Vibrio (spiral form, spores). This would appear to be somewhat after Hueppe. But the author is not consistent, and overleaf there appears "*Bacillus typhosus*," &c., which should read *Bacterium typhi* according to his classification, and this is followed by the cholera vibrio being included in the genus *Spirillum*.

Section III. deals with Tropical Medicine, and the diseases are arranged alphabetically. In ankylostomiasis the occurrence of eosinophilia might have been noted, though it is a symptom of helminthiasis generally, as is noted on p. 414. There is no distinction drawn between the two varieties of bilharzia; and *S. japonicum*, which one generally associates with bilharzia, is dealt with under distomiasis. Under dysentery the tests given for the various types are open to criticism.

One regrets that the author has seen fit to coin new words, *e.g.*, diathermasia (heatstroke), phœbism (sunstroke), granuloma endemica (Oriental sore), granuloma venera (ulcerative granuloma of the pudenda), and glandula idiopathica (tropical bubo). In liver abscess no mention is made of the treatment by aspiration with or without the injection of quinine, the advantage of this treatment being that sepsis of the abscess cavity is avoided—the most important point. The description of the kala-azar bodies is open to criticism, and the drawings are anything but flattering to Leishman's original ones, while on one page the parasite is depicted inside a red cell, where it is never found. It is taken for granted that the parasite of Oriental sore is the same as kala-azar, and no mention is made of the similar parasite found by Nicolle in the splenic disease of children.

The chapter on Malta fever is dreadfully out of date. Colonies of the micrococcus are described as "rosette-shaped," an appearance which is never seen except perhaps in the oldest cultures where the medium has dried up and shrunk. It is stated that the coccus is "scarcely to be found in the peripheral circulation," whereas if sought for at the right time it is found in hundreds, and even thousands, per cubic centimetre of blood. The method of transmission is stated to be "uncertain," and the theory of "diffusion by air currents" is mentioned. Surely these statements, in the face of the Reports of the Mediterranean Fever Commission, the last of which was published in April, 1907, are, to say the least, extraordinary.

Section IV. consists of practical hints on microscopy, photography, disinfection, and the examination of blood.

The term "leucolysis" is here used to denote decrease of leucocytes as opposed to increase, but we note that "leucopenia" is used to describe the condition of kala-azar, and therefore presume that "leucolysis" is a misprint.

One is surprised to be told that "mast-cells (granular basophiles)" are "never present in normal blood," and the statement emphasised in italics.

The appendices are very useful and good, and deal with a variety of things—International Sanitary Conventions; Vegetable Poisons of the Tropics, by H. N. Ridley, F.R.S.; How to Collect Blood-sucking Flies, Ticks, &c. (British Museum Pamphlet, by E. E. Austen, F.L.S.); Posological Table; Tropical Aspect of Examination for Life Assurance, by D. D. Galloway, M.D., F.R.C.P.; Various Tables (Milk, Temperature, Quarantine); and Regulations for the D.T.M.

We would repeat that the idea of the book is excellent, and such a collection of information in so small a space must be of great use to medical men in the Tropics, and with the requisite amount of adequate revision it should become really valuable. J. C. K.

EYE INJURIES AND THEIR TREATMENT. By Professor A. Maitland Ramsay, M.D. Pp. x. and 210. Glasgow: James Maclehose and Sons.

Professor Ramsay, in his preface, points out the importance of early recognition of the actual conditions following an injury to the eye, both from the point of view of the patient and his friends, and in respect of treatment, and that the general practitioner should not temporise in either of those aspects, but, except where absolutely confident of his knowledge and ability to deal with the case, should call in expert advice. Such knowledge and ability cannot, in the present condition of the medical curriculum, be widely spread among those whose duties must always lie chiefly among other forms of injury, and especially disease.

Hence the importance of such a volume as the present, where the fruit of years of experience is placed at the disposal of every intelligent medical man, and will enable him to avoid the Scylla and Charybdis of delay and unwise action.

All forms of injury are dealt with in a thoroughly practical manner, and the interpretation of the text is assisted by twenty-five admirably executed plates, most of them coloured.

Professor Ramsay calls attention to the practically constant infection of the conjunctival sac with pathogenic organisms, and the importance of dealing with this condition by irrigation with physiological salt solution or a saturated solution of boric acid. The other, and most important point in connection with injuries of the eye, the occurrence of sympathetic ophthalmia, is fully dealt with and illustrated by cases. The section on ocular therapeutics is valuable.

The author also includes the formulæ in use at the Glasgow Ophthalmic Institution. This is, of course, a useful compilation, but it adds considerably to the bulk and weight of the book, no less than fifty pages, while as the formulæ do not relate exclusively to ophthalmic work, but include many well-known combinations in use in general medicine, space and weight might therefore have been saved without detriment to the special purpose of the volume.

This volume is to be recommended as an addition to one's library.

R. J. S.

# Current Literature.

**Experiences of Gunshot Wounds of the Jaw during the Russo-Japanese War, and the Need of an Organisation for Affording Dental Aid to Soldiers.**—Dr. Otto v. Klingelhofer, of St Petersburg, was invited by the Dentists' Association of Niedersachsen-Hannover to read a paper on his experiences in connection with gunshot wounds of the jaw, on the occasion of the twenty-fifth anniversary of the foundation of the Association. His paper contains matter of considerable interest from a military point of view, and has been published as a reprint from the *Deutsche Zahnarztliche Wochenschrift.* It contains a short account of the present position of dental surgery in the armies of Europe, and of the agitation that arises from time to time in favour of a recognised organisation for supplying dental surgeons to the army. The author says that each war has emphasised the need of dental surgeons, and that Langenbeck stated that he would not again take part in a campaign unless the means for carrying out dental surgery were assured beforehand. In April, 1907, Sonnenberg, during a debate on the subject in the German Parliament, stated that the British during the South African War lost more soldiers from diseases of the teeth than from bullets, quoting from Mr. Brodrick's statement in the House of Commons, that the number sent home from South Africa from this cause, from the beginning of the war to October, 1902, amounted to 2,451. Again, he points out that without the use of proper dental apparatus, and without expert dental surgery at the time of the injury, many cases of injury to the jaw result in defects that cannot afterwards be remedied. This was pointed out by Süersen in 1871. The paper does not contain much that is of clinical interest, the cases quoted being few, and the notes regarding them extremely brief. The chief interest is in the author's remarks regarding dental organisation for the army. He points out very clearly the great difficulties connected with the question, both as regards the number of dentists required for a thorough organisation, and the cost involved. Taking, for example, the requirements for Germany, he states that, according to certain figures, 150,000 recruits are required annually, and that each recruit has on an average, in Germany, seven decayed teeth. In other words, there are some million decayed teeth to be dealt with amongst these 150,000 recruits. The dentist, he calculates, may be able to deal with 6,000 of these teeth, provided there were no complications, during the year. Accordingly, 175 dentists would be required for these recruits alone. But he says that the only satisfactory method of dealing thoroughly with the teeth of the soldiers would be to place one dentist in charge of every unit of 1,500 men. This would mean 430 dentists for the German standing army of 650,000 men. In Russia the extent of caries is not so great; according to some observations it is only from 3·03 to 3·39 decayed teeth per man. The author calculates from this that for the Russian army 1,000 dentists would be required, but that throughout the whole Empire there are not more than 6,000 dentists in practice, of whom more than half are women. But what seems to be of most practical importance is the necessity of having an organisation which will actually be of value to the private soldier himself, and the author considers that this can best be done by the establishment of dental stations in connection with regimental or garrison hospitals, and by instructing a sufficient number of medical officers in dentistry, through regular dental courses at the schools, and by giving the soldiers themselves regular lectures on the care of the teeth and the hygiene of the mouth. He points out that the employment of a few dental surgeons spasmodically, or by local regimental arrangements, has failed in Russia to be of much use to the private soldier. Their time is more or less fully taken up by the officers and their families; and he mentions some interesting facts in connection with the campaign in Manchuria. The demand for dental surgeons was made some months after the beginning of the war, and the Red Cross Society took the matter up, sending three dental surgeons out from St. Petersburg. The author of the paper, unfortunately, was unable to give any reports as to two of these dental surgeons, but as regards the third he states that he arrived in Mukden in the middle of September, 1904, and carried on work at a dental station there from December 2nd until February 24th, 1905, or for a period of two and two-third months. During that time he cost the Red Cross Society, in pay, equipment, and other expenses, £216, or at the rate of £85 per month. He treated 402 officers, 188 civil officials and Red Cross *personnel*, and only 312 of the rank and file. He told the author of the paper that soldiers used to come in squads of twenty men at a time for treatment, but were obliged to go away because his waiting-room was full of generals, colonels, and senior officers. This fact is quoted as an instance of the difficulty of getting at the soldier himself, except by a sound military dental organisation.

**Conditions of Service, Physical Standards, Pay, &c., U.S.A.**—Age: 18 to 35 years. Height: 5 feet 4 inches for Infantry, Coast Artillery, and Engineers; 5 feet 4 inches to 5 feet 10 inches for Cavalry and Field Artillery; 5 feet 8 inches to 6 feet for Mountain Artillery. Weight: Infantry, Coast Artillery, and Engineers not more than 190 lb.; Cavalry and Field Artillery not more than 165 lb.; minimum for all arms 128 lb., subject to variation for height, absolute minimum 120 lb. Chest measurement according to table; variations allowed according to table. Service, three years. Pay: fixed monthly rate plus rations, clothing, bedding, medicines and medical attendance.

FROM CIRCULAR 44. WAR DEPARTMENT, WASHINGTON, JUNE 3RD, 1908.

*Physical Equivalents.*

U.S.A.

| Height | Weight | Chest measurement | |
|---|---|---|---|
| | | At expiration | Mobility |
| Feet | lb. | Inches | Inches |
| $5\frac{4}{12}$ | 128 | 32 | 2 |
| $5\frac{5}{12}$ | 130 | 32 | 2 |
| $5\frac{6}{12}$ | 132 | 32½ | 2 |
| $5\frac{7}{12}$ | 134 | 33 | 2 |
| $5\frac{8}{12}$ | 141 | 33¼ | 2½ |
| $5\frac{9}{12}$ | 148 | 33½ | 2½ |
| $5\frac{10}{12}$ | 155 | 34 | 2½ |
| $5\frac{11}{12}$ | 162 | 34¼ | 2½ |
| 6 | 169 | 35¾ | 3 |
| $6\frac{1}{12}$ | 176 | 35¼ | 3 |

The following variations are allowed if the applicant is "active, has firm muscles, and is evidently vigorous and healthy."

| Height<br>Inches | Chest at expiration<br>Inches | Weight<br>lb. |
|---|---|---|
| 64 and under 68 | 2 | 8 |
| 68 ,, ,, 69 | 2 | 12 |
| 69 ,, ,, 70 | 2 | 15 |
| 70 and upwards | 2 | 20 |

These variations mean, for example, that a recruit $5\frac{6}{12}$ feet in height may be accepted if he measures 30½ inches chest girth after expiration, instead of 32½ inches, and weighs 124 lb. instead of 132 lb.

There is no age equivalent. The age limit is 18 to 35 years.

**Method of Recording the Medical History of Syphilitic Patients amongst French Colonial Troops.** (*Bull. Off. du Ministère de la Guerre*, July 6th, 1908, p. 1119.)—In consequence of the frequent changes of stations amongst Colonial troops, a special circular, dated June 3rd, 1908, has been issued concerning the maintenance of continuous records regarding the treatment of syphilitics.

For each man who contracts the disease a special medical history sheet of four pages is kept. It is called *Fiche sanitaire individuelle S*, and is marked "Confidential." On the front page the following facts are recorded: name, &c., diagnosis when first seen, confirmation of diagnosis;

symptoms at onset of disease, with dates; then a table giving month by month for four years, by means of abbreviated signs, the treatment carried out. On the other three pages there are blank columns for entry of medical examinations, in chronological order, and for observations relating to the progress of the disease. The sheet will be kept by the senior medical officer of each unit, and will be strictly confidential. When a syphilitic is transferred to another station or colony, his sheet will be transmitted to his new unit under double cover; the inner, containing the document, will be addressed to the medical officer, and the outer to the officer commanding the unit. Both will be marked "Confidential." Whenever a syphilitic is admitted into a medical establishment, the sheet will be forwarded in the same manner to the medical officer in charge, who will enter the treatment adopted, and such observations as he may think fit regarding the progress of the disease.

Each syphilitic will also be given a card of instructions, containing a table showing the treatment carried out, similar to the table of the medical history sheet, on one side, and short instructions on the other. By using this card the patient can keep himself instructed as to the treatment he is undergoing, and always have before him the rules which he should follow.

The medical history sheets and cards of instructions are made of cardboard sufficiently stout to be durable.

The table on the first page of the medical history sheet and on the card of instructions is drawn up as follows:—

*Periods of Treatment and Rest from Treatment.*

Letter M to be used to indicate months when mercurial pills and injections are given.

Letter I to be used for months when iodide treatment is employed.

Letter R to be used to indicate months of rest from treatment.

| Date of commencement of the disease | Months (name of month to be inserted in the numbered spaces) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | First year .. |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Second year .. |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Third year .. |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Fourth year .. |  |  |  |  |  |  |  |  |  |  |  |  |

On the card of instructions the following remarks are added below the table:—

"Consult the medical officer whenever any new symptoms appear."

"Invariably tell the doctor if you have had syphilis."

"Do not lose this card of instructions."

On the back of the card of instructions the following rules are printed:—

"(1) For the first four years at least, see the doctor every month."

"(2) Brush the teeth morning and evening with hot water and soap.

"(3) Do not chew tobacco, or even smoke.

(4) Do not drink alcohol. No pick-me-ups or liqueurs should be indulged in.

(5) Avoid sexual intercourse during the first months, and afterwards on the least appearance of sores on the mouth or genitals.

(6) Avoid using tho toilet articles, razor, table utensils, musical instruments, pipes, cigarette holders, &c., of others, and do not let them use yours.

(7) Do not marry until after the fifth year, and then only with the doctor's permission." W. G. M.

**Surra in the Federated Malay States.** (Studies from the Institute for Medical Research, Federated Malay States, No. 9.)—The authors (Fraser and Symonds) give a general account of the distribution and symptoms of surra in horses, cattle, and other animals. They recommend the inoculation of susceptible animals for diagnosis of the disease in cattle where trypanosomes are frequently scarce in the blood. Experiments in transmission of the disease by biting flies were successful with *Tabanus partitus*, *T. vagus*, *T. fumifer*, and *T. minimus*, when the flies were transferred immediately from the infected to the non-infected animal; similar experiments with stomoxys and hæmatopota failed. Attempts to transmit the disease by inoculation of the contents of the body cavities of *T. fumifer* were, a portion of them, successful when not more than twenty-four hours had elapsed since the fly had taken the infecting meal; after twenty-four hours all the experiments failed. The flies used in these experiments were killed by chloroform, and apparently the material inoculated did not include the contents of the proboscis.

Three experiments in the treatment of surra-infected horses by atoxyl, mercuric chloride and tartar emetic are recorded. Trypanosomes disappeared from the blood for a time, and the duration of the disease was prolonged, but no cure was obtained. It is to be noted that the atoxyl (in doses of 5 grammes) and the tartar emetic (in doses of 2·5 grammes) caused considerable colic in the horses. Experiments with the same drugs on dogs had similar results. The authors only found naturally acquired surra in stables near jungle where *T. fumifer* was plentiful. The paper concludes with a note, by H. C. Pratt, on the distribution of certain biting flies in the Federated Malay States.

W. S. H.

**Report on the Work of the French Sleeping Sickness Commission.** Edited by M. F. Mesnil, Paris, February, 1908.—The French Sleeping Sickness Commission, which was organised by the Société de Géographie, and placed under the supervision of the Pasteur Institute, left for the Congo in the autumn of 1906. A head-quarter laboratory was constructed at Brazzaville, on the lower reaches of the Congo, whence various members of the Commission made prolonged tours up country in their study of the distribution and etiology of the disease.

In discussing the early diagnosis of the disease with regard to the value of glandular enlargement, the conclusions arrived at vary somewhat from those of Dutton and Todd, namely, that enlarged cervical glands are nearly always symptomatic of trypanosomiasis. The report states: "The results obtained by the members of the French Commission differ from the conclusions of their English fellow-workers. In the French Congo, glandular hypertrophy is in no way synonymous with trypanosomiasis. The members of our Commission have collected a number of most reliable papers on this subject; all of them are not yet classified, and this part of their work is reserved for a later publication. But we can already extract a few particularly noteworthy facts.

"Thus Dr. Lebœuf, in a tour of inspection through Upper Oubangui, has examined 257 individuals who had glands which were more or less capable of being punctured; 91 only were found to be the subjects of trypanosomiasis—35·4 per cent. Of these 91, 80 showed trypanosomes in the glands—31·12 per cent. of the total number."

"On the other hand, patients infected with trypanosomiasis do not invariably show any marked adenitis. In particular, R. Koch, in his last report, draws attention to this point. The French Commission, on its side, has collected facts, and cites as an example a series of cases in which 39 per cent. had not glands large enough to be punctured; in the same series 25 per cent. of the individuals with glands that could be punctured showed no trypanosomes by this examination. Dr. Kerandel, in his tour through Upper Sangha, has arrived at conclusions similar to those of the Research Commission.

"The points are of extreme importance, for they establish the fact that, as far as concerns the French Congo, generalised adenitis is not a constant symptom of trypanosomiasis, and that it is not reasonable to attribute to glandular hypertrophy such a degree of importance as Dutton and Todd would wish."

In discussing the microscopic diagnosis of trypanosomiasis, Martin and Lebœuf divide cases into three classes:—

"(I.) Clinical cases: that is to say, cases in which diagnosis is evident without microscopical examination.

"(II.) Suspected cases, in which the clinical symptoms do not justify a diagnosis.

"(III.) Cases in good health, in which no symptom, even slight, would make one think of the existence of the affection.

"With regard to the search for the *T. gambiense* in the peripheral blood in 217 trypanosomiasis cases, examined by simply looking through a film between cover-slip and slide, eighty positive results were obtained, about 38 per cent. Lebœuf, in Oubangui, obtained about 44 per cent. with the same method.

"Of seven Europeans attacked, six gave positive results, and the highest proportion was obtained from Class III., "patients in good health."

After centrifugalisation of the peripheral blood positive results were obtained in 92 per cent. of affected cases.

In searching the lymph extracted from the superficial glands, out of 217 affected cases examined, the trypanosome was found 197 times, making a proportion of about 91 per cent.

The report goes on to say: "The members of the mission had recognised, like Dutton and Todd, that it is in the cervical glands that the trypanosomes are most frequently found. They give on this subject a very instructive table bearing on forty-two cases examined in which the four principal groups of glands (cervical, axillary, epitrochlear, and inguinal) have been punctured. Another group, the submaxillary, from the point of view of positive results comes immediately after the cervical; it presents, moreover, the advantage of being easier to puncture. It must be noted that the percentages are nearly independent of the class to which the case belongs.

There is nothing particular to be noted in the technique of the examination of the cerebro-spinal fluid. The results of the writers who have examined 105 cases are interesting, in that only 83 per cent. of clinical cases have shown trypanosomes, and that two cases in "good health," out of seven examined, have also shown them. Thus there is no absolute agreement between the state of the case and the presence of the trypanosomes in the fluids which bathe the central nervous system.

The writers next went into the question of the comparative values of these different methods of examination; that is to say, they determined the procedure which permitted the discovery of trypanosomes with the greatest certainty and in the least time, and which, moreover, is least objectionable to the natives who are being examined. The best method is considered to be that of centrifugalisation of the blood, after a primary direct examination,

Not only are the total percentages superior to those given by the gland method, but what is particularly important from a diagnostic point of view is that the method is equally successful in "suspected areas" and "cases in good health." Lastly, bleeding is best submitted to by the natives.

Martin and Lebœuf give the following *résumé* of the method which they advise should be carried out in the search for trypanosomes:—

(1) Thorough and systematic examination (of ten minutes duration), using a movable stage, of a film of blood from the pulp of a finger, or preferably of two films taken from fingers of opposite hands.

(2) If the first examination is negative and the subject has glands which can be punctured, make two punctures, choosing for preference the cervical glands. If these are not enlarged or are too small, proceed to the submaxillary glands or to the inguinal, which may give a better result.

(3) If still no parasites have been found, take 10 cc. of blood from one of the veins at the bend of the elbow and centrifuge it; examine one or, if necessary, two films from the third sediment.

(4) If now one has failed to find the trypanosomes the individual is most likely perfectly healthy, but to make certain, if it be consented to, it is useful to make a lumbar puncture, draw off 10 cc. of cerebro-spinal fluid, and examine the sediment after centrifugalising for fifteen minutes.

Martin and Lebœuf, in their investigations, found that 48 per cent. of cases showed the presence of filaria in the blood in direct examination, and 86 per cent. after centrifugalisation.

They both insist on the rapidity with which Europeans become infected on the Congo, and cite the case of an officer who arrived at Brazzaville on May 20th, 1907, and showed trypanosomes in his blood on August 1st. With regard to treatment, atoxyl was given in doses from ¾ to 1 gramme every ten days. Cases of intolerance and eye troubles led the members of the mission to lessen the dose. Some improvements were obtained, but fatal relapses in spite of fresh injections were numerous. Cases diagnosed early are stated to have had a lasting improvement and may be cured. Alternate injections of atoxyl and benzoate of mercury were tried, also citric acid, picric acid, and atoxyl; no exact results are as yet forthcoming.

In speaking of the mode of transference of the disease from one individual to another, the report says that a study of the epidemiology would seem to indicate the presence of other factors than the tsetse-fly. The reasons given are briefly these: A want of coincidence has been observed between the numbers of *Glossina palpalis* present and the frequency of case incidence; villages near the rivers where the fly is found in great numbers do not show a greater number of cases than those situated on the hills far removed from the fly region.

Further, the natives suppose the disease to be spread by the personal contact of persons living in the same hut; and the members of the mission support the statements of Kudicke and Koch in believing that the disease can be transmitted by sexual intercourse. The infection of children has been noticed, and it has been thought that mosquitoes may be a means of transference.

Roubaud has described developmental changes taking place in mosquitoes belonging to the *Stegomyia* and *Mansonia* orders — changes resembling those described as occurring in *G. palpalis*. Allusion is made to the successful transmissions of disease by means of the stegomyia, which have been carried out by Fulleborn and Martin Mayer at the Hamburg Institute, the essential feature in these experiments being the immediate transference of the mosquito from the affected to the sound animal. This would explain the method of transmission among individuals living in the same huts.

Roubaud describes an evolution occurring in the proboscis of the *G. palpalis* distinct from that taking place in the intestinal tract, which is followed by regurgitation.

The account is as follows: "Some trypanosomes, sucked in by the insect with the blood of the infected mammal, are arrested in their passage in the proboscis; they become changed, and a rapid evolution takes place in the saliva. The trypanosomes are fixed firmly to the walls of the proboscis by the ends of the flagella, which become lengthened and thickened; the undulating membrane completely disappears, and the centrosome becomes anterior to the nucleus. In this position the trypanosomes undergo rapid multiplication from the first hour after the withdrawal of the blood. Their length of life does not appear to be more than two days for the trypanosome of nagana, but as long as four and a half days for *Trypanosoma dimorphon* and five days for *T. gambiense*."

This evolution is said to take place nine times out of ten in the tsetse sucking infected blood; stomoxys, on the other hand, never showing it.

In speaking of prophylaxis, the value of systematic isolation is insisted on. Drug treatment is advocated also, for the reason that, though cure may not be effected, the disappearance of the trypanosome from the peripheral blood removes to a large extent possible sources of infection.

W. B. F.

# Correspondence.

## A MASONIC LODGE IN LONDON IN CONNECTION WITH THE ROYAL ARMY MEDICAL CORPS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—Some three years ago, at the Corps Dinner, we discussed the advisability and feasibility of starting a Masonic Lodge in London in connection with the Royal Army Medical Corps, and we thought, as experienced masons, that such a project was not only practicable but that it might well prove to be highly desirable, in promoting *esprit de corps* on the one hand, and assisting our charities on the other. Unfortunately, at that time, our old friend "exigencies of service" intervened, and our idea never got beyond incubation. But it so happens that the "exigencies of privilege leave" have thrown us together for the last fortnight, and the outcome of that "foregathering" is a revival of the nascent idea. We think that the establishment of—shall we say, Lodge "Fidelis"?—would be distinctly advantageous to the Corps, and in that assumption we crave the hospitality of your columns, knowing no other way by which we can get at the "Brethren" in the Corps who would be inclined to support us. And by "the Corps" we mean not only the officers of the Regulars past and present, but the Territorials, and possibly, if it is deemed advisable, the warrant officers and senior non-commissioned officers of both. We want to foster forbearance, tolerance, *camaraderie* and good fellowship—in short, Freemasonry—in every branch of the Corps. If, then, any of your readers who are in sympathy with this project and are willing to support it, will communicate with either of us, or better still, if any officer located in or near London will undertake *pro tem.* the duties of honorary secretary, there should be no difficulty in giving effect to the scheme. There is a precedent, to wit, Lodge "Ubique" of the Royal Artillery. At this stage it would be premature to discuss details even if you were willing to afford the space, but we might just say that the bye-laws will be framed to meet the requirements of a nomadic *clientèle*, and no doubt "Ubique" will gladly give us a few tips. Further, as the annual dinner of the Corps takes place on a Monday, the Saturday preceding would appear to be a suitable day to fix for the installation meeting. It is evident that we must have more founders than is usually requisite to guard against premature decease, and therefore we urge all masons in the Corps to come forward at once; the expense need not be great, nor the calls upon leisure exacting.

We are, &c.,
R. H. FORMAN, *Colonel,*
*Grand Master, O.S.F.I.*
J. G. HARWOOD, *Colonel,*
*P.M., P.Z., &c.*

*Bombay,*
*September* 17*th*, 1908.

## THE TREATMENT OF SYPHILIS BY INTRAMUSCULAR INJECTIONS OF INSOLUBLE GREY OIL.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—With reference to Major Porter's letter on this subject in the August number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, I beg leave to make a few remarks in reply.

I concur with Major Porter that Army Order 158 of September, 1907 (later embodied into paragraphs 1080 and 1174 King's Regulations), arranging for the out-patient attendance of soldiers, has "resulted in a large number of men leaving the Army cured, enormously reduced invaliding, and has diminished the spread of syphilis amongst the civil population." If Major Porter will look at the preface to my book he will find that 144 pages of printed matter were submitted by me for the consideration of the War Office in July, 1903. On the return of this manuscript in September, 1903, I was unable to publish my views as I was on the eve of foreign service, so I re-wrote the military aspects of what I had to say and submitted it for the Parkes Memorial Prize in December, 1905. This essay I later published in the form of a book "Syphilis in the Army, 1907." The so-called "attack on Colonel Lambkin" is presumably my reply in the July Journal, written at the request of many officers of the Corps, to the review of my book in the May Journal. Major Porter, in writing of his plan of treatment by intramuscular injection of insoluble grey oil, says "no treatment is ever given before the appearance of the initial rash." This is absolutely opposed to reason, to the best teaching of the profession, and to the mass of evidence of both civil and military experts, as judged by the Advisory Board Reports. In my opinion it is quite unjustifiable in the majority of cases to thus suspend treatment for three or four months after a man has contracted syphilis; and recent experimental research on monkeys conclusively proves this, and utterly condemns such a practice (*vide* article by Neisser in the *British Medical Journal*, October 10th, 1908; also Mr. Jonathan Hutchinson's remarks in "System of Syphilis, vol. 1, 1908).

Regarding the efficiency of inunction methods, Colonel Lambkin wrote of an officer so far back as Army Medical Department Reports, 1891, Appendix IV.: "I saw him five weeks after his departure for Aix. I was astonished at the improvement he had made. Every sign of the disease had gone, he had put on weight, and looked a different man. The case made a great impression on me. I had two other similar cases. I was so struck with the above cases that I determined to pay a visit to Aix. In October, 1889, I went there. Class was well represented, from the peer to the prize-fighter. Most of the English cases I met were of at least a year's standing; they had been under treatment at home, but the disease recurring over and over again, and being sick of taking medicine internally, they at last found their way to Aix. They were all loud in their praises of Aix and the treatment, and the benefit they had derived from it. Here, I may remark, that it is astounding to me the ignorance that exists (whether real or assumed) among the profession in England concerning the treatment carried out at Aix-la-Chapelle. Dr. Brandis, at Aix, said, "Why do you not carry out this treatment in England?" I remarked "How can we without the Aix waters?" He answered, "You do not need the water; any water will do, provided it is soft. The baths are used solely for the purpose of preparing the skin for the inunction of mercury." I learnt that by far the best channel for the introduction of mercury into the system is through the skin, and that the internal administration of mercury into the system is radically wrong, and in my opinion should never be employed. In my essay for promotion, which I wrote in May, 1891, I gave the notes of my syphilis cases which were all treated at the Shorncliffe Hospital by this method, showing the marked success I had with this treatment." The practice at Aix prevails at the present day.

I am therefore surprised to see Colonel Lambkin, when reviewing my book, write that "nine times out of ten injections are used in the Army," and Major Ward, at the same hospital, wrote in January, 1908, "It is very seldom patients are put on inunctions; we have not had a case for a long time." This, quite apart from my description of the method of inunction in use at Woolwich being called "crude and antiquated." I also regret to see that Major Porter says, "In spite of the experience of the civil surgeons quoted by Major French, the number of surgeons who use it (*i.e.* intramuscular injections of insoluble salts of mercury) to the exclusion of all other methods is vastly in excess of those who treat the disease by inunction or by the mouth. I hope that what Major French has written, coming as it does from a specialist and teacher of young officers at one of our largest hospitals, will not have the effect of deterring our younger brethren from the use of intramuscular injections." I take marked exception to this reflection on my teaching, as some thousands of these intramuscular injections have been given to "out-patients" at Woolwich. For fifteen years, in large military stations, including Woolwich, Chatham, London and Cairo, I have tried most known methods of treating syphilis, and recorded the results. I have found inunctions of ung. hydrarg. the best in the early stages for in-patients, I also use mouth methods later, and advocate quinine as well for ten years. This possibly explains why there is only an average of eight cases of syphilis in hospital at Woolwich, a garrison of nearly 5,000 men, when in an identically situated town garrison 4,000 strong, viz., London, where in-patients are treated by intramuscular injection of insoluble salts of mercury, or soamin, twenty-six beds have been constantly occupied by syphilitic cases, and 687 venereal cases, including 121 cases of syphilis, have in addition been sent to Woolwich for treatment from London since September 17th, 1907, to date (October 10th, 1908).

Major Porter, speaking of a country garrison at Colchester 3,300 strong, says "the comparative emptiness of the 24-bedded ward which is appropriated to the treatment of venereal sores and syphilis is a constant source of surprise to those who know the strength of the garrison and the average of about seventy weekly out-patients."

At Woolwich the garrison is nearly 5,000 strong, the average weekly out-patient attendance for this year to date is thirty-five, and the average monthly attendance numbers twenty-six. In 1905, the strength of the garrison being the same, the average weekly out-patient attendance for syphilis was nearly 150 (in-patients being at that time treated by intramuscular injections of insoluble grey oil.) The "monthly" list is an inspection roll for men who have been over one to two years under previous active mercurial treatment, and who are waiting between courses of injections, &c. In October, 1905, when I instituted inunctions for in-patients, I was able to initiate this valuable monthly roll. It works well with Commanding Officers, and is popular with the men, as they appreciate the occasional escape from a too rigid weekly inspection. In large stations it admits of more detailed observation and treatment of the earlier cases of syphilis on the weekly roll. The reduction of syphilis at Woolwich has been effected by the early recognition and by the very thorough treatment of cases in hospitals by inunctions, baths, and dietary in the earlier and much more remediable stages of the disease, long before the rash develops. By these means tertiary syphilis and nervous affections are admittedly best prevented, and more thorough treatment is not made subservient to the convenience of a less curative weekly injection for "in-patients," which, as an extensive investigation has proved, does not curtail the time spent in hospital.

*Woolwich,* H. C. FRENCH, *Major, R.A.M.C.*
*October* 10*th*, 1908.

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# Original Communications.

## ON MILITARY PRISON DIETARIES.

BY LIEUTENANT-COLONEL A. M. DAVIES.
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IT is desirable to determine, from as large a number of ascertained data as possible, what are the real food requirements of the human body. Not only is this knowledge important from the purely scientific, *i.e.*, physiological point of view; but, considered as a predominant factor in estimating the social or economic status of any collection of people, the actual quantities of nutritive material of one sort or another that the body needs under varying conditions require to be known, before a sound opinion can be given as to whether such and such a collection of persons is, or is not, in a poverty-stricken or destitute condition. For instance, Mr. Seebohm Rowntree, in his careful study of the economic condition of the population of York ("Poverty, a Study of Town Life," 1903), adopted Atwater's standard requirement for a man doing moderate work, a diet containing 125 grammes protein, and yielding 3,500 calories of energy value; he selected a dietary which afforded adequate nutrition according to this standard at the lowest practicable cost; and came to the conclusion that 10 per cent. of the inhabitants of York were unable to afford such a dietary, and were therefore living in a state of "primary poverty." (Families whose total earnings are insufficient to obtain even the minimum necessaries for the maintenance of merely physical efficiency are said to be in a condition of "primary poverty.") If, however, some other standard had been taken, for instance that proposed by Chittenden, containing a much smaller quantity of protein, obviously the condition of these families—from the theoretical dietetic standpoint—would be very different.

There are three ways in which the quantity of nutritive material required by the body under the varying conditions of rest and work may be estimated. (1) Theoretically, the mechanical work performed, and the heat evolved, by the body may be calculated; then, with a knowledge of the energy value, or calorific value, of the alimentary principles—protein, fat, and carbohydrates—the amounts of these necessary to be provided in order to furnish the energy for the mechanical work, and the heat required, may also be calculated. (2) Practically, the actual quantities of food that are in use by, and have been in fact found to be sufficient for, collections of persons such as soldiers, sailors, prisoners, gangs of workmen, &c., may be recorded, the alimentary principles and energy value calculated therefrom, and so a general conclusion arrived at. There is also a third way, in which the experimenter sojourns for a longer or shorter time in a calorimeter; the heat evolved from his body, and the mechanical work performed, being accurately measured, and compared with the energy and calorific value of the food supplied. There are difficulties, or fallacies, or both, to be overcome or guarded against in each of these methods. Thus, in regard to the actual food taken by any large body of men, it is difficult to ascertain with any close accuracy the amount and nature of the food consumed by the individuals; errors of excess and defect must be trusted to balance each other. In cases where the collections of people are kept under restraint, as in a prison or workhouse, although the nature and quantity of the food may be more accurately known, the mere existence of the restraint introduces an abnormal condition, which complicates the question at issue.

Provided this liability to fallacy be recognised, it is probably worth while to make as many such observations as possible; this is the reason for making the small contribution to the study of the subject that follows.

## I.

The question of the sufficiency, or otherwise, of the dietaries in military prisons (as they were then termed) came up for consideration in 1904. Four scales were in use at home stations: (1) For prisoners undergoing punishment for seven days and under; (2) for men under sentence from seven up to forty-two days; (3) for those undergoing sentences exceeding forty-two days without hard labour; and (4) for men under similar sentences with hard labour. (See "Allowance Regulations," 1900, para. 74.) The nutritive values of these four scales, in grammes, with the Calories afforded, were as follows:[1]—

| | Protein | Fats | Carbohydrates | Calories |
|---|---|---|---|---|
| Scale I. | 92 | 26 | 496 | 2,648 |
| II. | 120 | 52 | 470 | 2,906 |
| III. | 127 | 65 | 497 | 3,272 |
| IV. | 141 | 69 | 568 | 3,614 |

These values were worked out on the average daily nutritive values of the diet, by calculation from the actual food provided during a seven-day period.

These scales may now be compared with standard dietaries that have been proposed, and with other prison diet scales that are available.

| | | Protein grammes | Fat grammes | Carbohydrates grammes | Calories |
|---|---|---|---|---|---|
| Ordinary work. | Moleschott | 130 | 84 | 404 | 2,970 |
| ,, | Voit | 118 | 100 | 333 | 2,780 |
| ,, | Ranke | 100 | 100 | 250 | 2,365 |
| Light work. | Atwater | 110 | — | — | 3,000 |
| Moderate work. | ,, | 125 | — | — | 3,500 |
| Hard work. | ,, | 150 | — | — | 4,500 |
| Ordinary work (1907). | Halliburton | 135 | 97 | 413 | 3,150 |
| Ordinary prisoners, Scotland. Light work | | 135 | 35 | 536 | 3,115 |
| Convicts, Scotland. | "Hard labour" | 173 | 57 | 602 | 3,707 |
| Ordinary prisoners, England. "Light labour" | | 138 | — | — | 3,381 |
| Convicts, England. | "Hard labour" | 177 | — | — | 4,161 |

It was formerly the custom among physiologists and writers on hygiene to specify the respective amounts of fats and carbohydrates that ought to be present in a dietary, judging from the proportions that were found to exist in diet scales actually in use. Of late years, Atwater and most writers on the subject have only specified the quantity of protein required and the Calorie value of the whole dietary, it being considered that fats and carbohydrates can replace each other in supplying the physiological needs of the body. It is a fact, however, that while in the diet tables of public institutions (that are usually constructed on the most economical principles as regards cost) the fats are very low and the carbohydrates relatively high, in the dietaries of persons who are able to make their choice, and follow their natural instincts, the relative quantity of fatty principles is, as a rule, markedly higher. It is probable that, as regards digestibility and ease of assimilation, the carbon of the food is preferably presented in the form of fat, in the proportion of about one part of fatty to four or five parts of carbohydrate material; therefore that the fatty constituents should not be less than one-fourth or one-fifth of the carbohydrates.

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[1] Calculated according to Atwater and Bryant. Bulletin No. 28, U.S.Dept. of Agriculture, 1902.

There is a fairly general agreement that for a man of average weight, not performing any muscular work, a diet yielding 2,500 Calories is sufficient; for moderate work about 3,000 Calories are required; while, for hard muscular exercise, from 3,500 to 4,500 Calories should be supplied.

The work performed by military prisoners at the time of this enquiry was, briefly, as follows:—

On Scale I., seven hours hard exercise and three hours oakum picking, or the like; in all, amounting to more than eight hours hard work.

On Scale II., for the first fourteen days the same as on Scale I.; for the next four weeks, three hours hard exercise and seven hours industrial work (such as mat-making, &c.); in all, amounting to more than six hours hard work.

On Scale III., one hour's exercise, and nine hours easy work.

On Scale IV., for the first fourteen days the same as on Scale I.; for the rest of the time, three hours hard exercise, and seven hours industrial work; in all, more than six hours hard work.

*Note.*—The dietaries were changed after seven days' imprisonment; the nature and amount of labour performed, after fourteen days.

The diet scales may now be considered, as to their sufficiency or otherwise, from a physiological standpoint,

*Scale I.*—This dietary is insufficient to maintain health and strength, and keep up the body-weight for any lengthened period, while doing ordinary or even very light work; *a fortiori* it is not enough to maintain the body-weight of a man doing hard work, such as is required of prisoners on this scale. But it is very doubtful whether it would be at all prejudicial for a young and healthy man to be on this restricted diet for a *short* period, such as seven days, or less. Most young men, who are able to afford it, habitually take too large a quantity of nitrogenous food, especially flesh meat. One need not go so far as Professor Chittenden, and assert that about fifty grammes of protein are sufficient, as a daily average, for the ordinary man engaged in active exercise; but it must be allowed that he has shown that health and strength can be maintained, at any rate for some length of time, on much smaller quantities of nitrogenous food than have hitherto been considered necessary. For a short period, such as a week, it is probable that a restricted dietary, such as Scale I., would not only not be harmful, but would in nearly every instance be beneficial, purely from a health point of view. It would, no doubt, at the time be rather disagreeable, but that is not the point.

*Scale II.*—For the first seven days the same remarks would apply as to Scale I., but in a lesser degree. For the next five weeks, or less (one week, eight hours hard work; four weeks, six hours hard work), the dietary would be insufficient, and increasingly so; from 3,500 to 4,000 Calories should be supplied in the diet, in order to keep up body-weight and strength, whereas the energy actually afforded is only 2,906 Calories.

*Scale III.*—This yields 300 Calories in excess of the Moleschott standard for ordinary work, but 230 Calories less than the more recent standard of Atwater. On the whole it may be considered sufficient.

*Scale IV.*—For the first fourteen days the dietary would be insufficient, as the energy afforded is only about enough for moderate work, according to modern standards, whereas the labour performed is "hard" work, without doubt; for the rest of the time the dietary is sufficient for moderate work; and it may be considered, under the circumstances, as on the whole adequate.

## II.

So far the subject has been looked at from a theoretical standpoint, and the above remarks are deductions drawn from the more or less concordant teaching of the text-books. When investigated practically, it was found that these deductions were not altogether borne out by the facts.

The sufficiency or insufficiency of the dietary might be determined practically: (*a*) by careful inspection of a large body of prisoners, to see whether they were in a good state of health; (*b*) by study of the records of prisoners' weights, to see whether there were, on the whole, a gain or loss of weight while in prison; and (*c*) by study of the statistics of sickness, especially of prisoners undergoing long sentences.

(*a*) Two prisons were visited, Aldershot and Dover; in Aldershot prison there were about 150, and at Dover about 250 prisoners. The Aldershot prisoners were, to all appearance, in excellent health, with the exception of some five or six individuals, two of whom suffered from some derangement of digestion, and two or three others were somewhat below par. The Dover prisoners also all appeared to be in excellent health, with the exception of four, who suffered from ailments of no significance from a dietetic or hygienic point of view. Judging from these 400 men, one could not say that their health had been at all injuriously affected by the use of the restricted dietary.

(*b*) Through the courtesy of the Governor of the Aldershot Military Prison, statistics were obtained showing the prisoners' weights, taken on admission and discharge, at that prison during the five years, July, 1899, to June, 1904. These are summarised in the following statement :—

| | 42 days and under | | | 43 to 84 days | | | 85 to 168 days | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gained | Lost | No change | Gained | Lost | No change | Gained | Lost | No change |
| | 1,061 | 1,469 | 738 | 1,011 | 497 | 220 | 247 | 86 | 50 |
| Per cent.: | 32·5 | 45 | 22·5 | 58·5 | 28·8 | 12·7 | 64·5 | 22·5 | 13 |

From this it appears that short-sentence prisoners (under forty-two days) more often lost than gained weight ; while long-sentence men (both up to eighty-four days and over) generally gained. This was the result on the whole, and in most years ; only in one period (1904) did the men under forty-two days, on the whole, gain in weight ; in two periods (1899 and 1900) more men serving from forty-three to eighty-four days lost than gained weight ; in every year men confined over eighty-five days gained much more than they lost in weight.

In order to obtain a larger number of facts, and so eliminate fallacy as far as possible, the weights in detail of all the prisoners confined in the larger military prisons during the year 1903 were extracted from the Annual Return. In these twelve prisons the average daily prison strength was 1,120, and the total prison population for the year was 10,437. Of this population 40·8 per cent. gained, 24·6 per cent. lost weight, and in 34·6 per cent. there was neither gain nor loss. The actual figures were as follows :—

| | Total population | Average daily strength | Average daily sick | Gained weight | Total lb. gained | Lost weight | Total lb. lost | No change |
|---|---|---|---|---|---|---|---|---|
| | 10,437 | 1,120 | 28 | 4,236 | 13,055 | 2,552 | 6,483 | 3,587 |
| Percentage : | .. | .. | .. | 40·8 | .. | 24·6 | .. | 34·6 |

When arranged according to length of sentence, the following was found to be the incidence of gain and loss in weight : Under forty-two days sentence 31·7 per cent. gained in weight (the average gain being 2·4 lb. per man), and 25·3 lost (the average loss being 2·2 lb.) Between forty-three and eighty-four days 60 per cent. gained (average 3½ lb.), and 23 per cent. lost (average 3 lb). Between eighty-five and 168 days 61 per cent. gained (average 4¾ lb.), and 22 per cent. lost (average 4 lb.). Of the longer-sentence men, between 168 and 365 days, 58 per cent. gained (average 4⅓ lb.) and 25 per cent. lost (average 4 lb.). Of those sentenced to over a year's imprisonment 52 per cent. gained (average 3½ lb.). and 31 per cent. lost (average 3⅓ lb.).

Judging from this year, 1903, therefore, it appeared that *in each class* of prisoner a larger number gained than lost in weight, in spite of all theoretical considerations. There were variations in the different prisons not easy to account for; thus, of short-sentence prisoners at Cork 314 gained and only 57 lost weight; while of similar prisoners at the Curragh 54 only gained and 296 lost; the proportions being almost exactly reversed. At Colchester, Devonport, Gosport, Cork, Dublin, and Stirling the gains were largely in excess of the losses in this class of prisoner; at Aldershot, Dover, Woking, York, and the Curragh the losses were in excess of the gains. For all other classes of prisoners the gains considerably exceeded the losses (with the exception of the Curragh).

Reviewing these statistics as a whole, it seemed fairly evident that the authorised prison dietary was sufficient as regards Scales III. and IV. (forty-three days and over); this applied (taking the figures for 1903) to 3,344 prisoners. The sufficiency of Scales I. and II. (applying to 8,232 prisoners) seemed to be doubtful. In regard to Scale I. (sentences of seven days and under), as already stated, it did not appear that, for this short period, a restricted diet would be injurious even to a young soldier. In regard to Scale II. (seven to forty-two days) something was to be said on both sides; theoretically it was insufficient; practically the weighings, taken as a whole, did not bear out this view, though in some instances, as at the Curragh, such an insufficiency apparently did exist.

(*c*) *Statistics of Sickness.*—No definite information could be gained from these statistics bearing on the present question. If the dietary were markedly insufficient one would expect to find that long-sentence men would, in a certain proportion of cases (particularly men of rather inferior physique), be unable to do their allotted tasks, and would be admitted to hospital, or treated, for debility, digestive disturbance of one kind or another, or boils indicating malnutrition). This did not appear to have been the case; at Dover twenty-nine cases of boils were treated during the year under examination, but at no other prison was there any prevalence of this affection; at Dover also there were thirty-six cases of diarrhœa, but only one serious enough to require admission to hospital. At many of the prisons the slighter cases of sickness (not requiring admission to hospital) were not specified, and therefore there was no means of knowing whether any prevalence of slight digestive disturbance, possibly due to the diet, actually existed. The constant use, twice a day, of oatmeal porridge (called "gruel"), made from coarse Scotch oatmeal, might very possibly cause diarrhœa, but there was no record that this actually was the case.

So far as the statistics went (1903), there was nothing to show that any sickness, or deterioration in health, was caused by insufficiency or improper character of the dietary. It had been asserted that the effects would not become manifest until after the men's discharge, being slow and insidious in operation. As, however, in all classes of prisoners undergoing more than forty-two days imprisonment, the number who *gained* weight was largely in excess of the number who *lost* weight, it was impossible to maintain that, on the whole, there had been any deterioration in the health of the prisoners during their stay in prison, such as could lead to bad effects afterwards.

## III.

The quality of the articles supplied, so far as the observations extended, appeared to be (with very slight exception) excellent; the bread, meat, cheese, oatmeal and potatoes, at Aldershot and Dover, were of the very best. At one station the cocoa appeared to consist principally of starch and added sugar—it was certainly not pure cocoa; the vinegar also was of very inferior quality; these were, however, trifling exceptions to the general excellence of the dietary constituents.

The cooking was also found to be excellent, so far as observed; the soup was good, the bones properly treated to extract their nutriment, and the suet pudding well boiled and palatable.

## IV.

Many medical officers in charge of military prisons had expressed an opinion to the effect that, on the whole, the dietary was insufficient and required additions. This opinion was not borne out, on the whole, by the records of the weights of the prisoners (which in the greater number of cases showed an increase); nor by the statistics of sickness (which afforded no evidence of debility or disease due to malnutrition); nor was it supported by the appearance of those men, about 400 in number, whom there was an opportunity of examining.

The case of short-sentence prisoners on Scale II. (sentences from eight to forty-two days), however, required some further consideration. Theoretically, the dietary was insufficient for the labour to be performed, this insufficiency being considerable (see p. 559). And although a larger number of men gained than lost weight (under forty-two days),[1] the actual number that lost weight (2,284) during the year was considerable. The loss was not great, averaging only 2·2 lb. per man; but, as these men returned to their duty as soldiers, the State, their employer, had no desire to reduce their weight, or bodily efficiency, in the slightest degree. The Inspector of Military Prisons had pointed out that of 22,000 prisoners more than one quarter were lads under 20 years of age, and more than one-third had less than two years service. They were immature and growing lads, and it would be impolitic to interfere with their normal physical growth and development. At the same time imprisonment, to be of any use, must have a deterrent effect, and there can be no doubt that in this the restricted diet has a large share.

It was not considered that any increase was required in Scales I., III., or IV. In Scale II. (sentences from eight to forty-two days) an increase was recommended and sanctioned. The increase was obviously most required in the fatty class of foodstuffs; for reasons of practical convenience and economy, it was desirable that the increase should take place in articles of food already provided in the dietary scales, rather than by introduction of fresh constituents; and on general grounds it was almost necessary that the increase should not be greater than would raise Scale II. to Scale IV. For these reasons the following additions were recommended in Scale II.:—*Sunday:* flour, 8 ounces instead of 6 ounces; suet, 1⅓ ounces instead of 1⅛ ounces. *Tuesday, Thursday and Saturday:* cheese, 2 ounces instead of 1½ ounces. *Wednesday:* cheese, 2 ounces instead of 1½ ounces; pork, 4 ounces instead of 3 ounces; split peas,

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[1] It was impossible to distinguish between prisoners on Scale I. and Scale II. in regard to the weighings; possibly the principal losses of weight occurred amon the men on Scale I.

4 ounces instead of 3 ounces; vinegar, ¼ ounce instead of ⅙ ounce. The effect of the alteration was to provide on Sundays 1 lb. of suet pudding (instead of ¾ lb.); on Wednesdays, 1 pint of pork- and pea-soup (instead of ¾ pint); and on Tuesdays, Wednesdays,

SCALES OF DIETS FOR SOLDIERS IN ARREST AT HOME STATIONS, WHETHER CONFINED IN MILITARY PRISONS OR DETENTION BARRACKS, OR IN DETENTION ROOMS.

| Diets | Bread | Cheese | Cocoa | Flour | Beef or mutton | Pork | Milk | Oatmeal | Peas, split | Potatoes | Salt | Sugar or molasses | Suet | Vegetables | Vinegar | Pepper every 100 soup diets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. | oz. |
| SCALE I. | | | | | | | | | | | | | | | | |
| (*For soldiers in arrest undergoing punishment by sentence of court-martial or award of C.O. for seven days and under*) | | | | | | | | | | | | | | | | |
| Sunday and Wednesday | 24 | .. | .. | 4 | .. | .. | .. | 4 | .. | .. | ½ | .. | ¾ | .. | .. | .. |
| Monday and Friday .. | 24 | .. | .. | .. | .. | .. | .. | 4 | .. | 8 | ½ | .. | .. | .. | .. | .. |
| Tuesday, Thursday, and Saturday | 24 | .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. | .. | .. | .. | .. | .. |
| SCALE II. | | | | | | | | | | | | | | | | |
| (*For soldiers in arrest undergoing sentences exceeding seven days, and not exceeding forty-two days*) | | | | | | | | | | | | | | | | |
| Sunday .. .. .. | 18 | .. | .. | 8 | .. | .. | .. | 4 | .. | 16 | ½ | .. | 1½ | .. | .. | .. |
| Monday and Friday .. | 18 | .. | .. | ¼ | 8 | .. | .. | 4 | .. | 16 | ½ | .. | .. | ½ | .. | .. |
| Tuesday, Thursday, and Saturday | 22 | 2 | .. | .. | 6 | .. | .. | 4 | 2 | 8 | ½ | .. | .. | 3 | .. | 1 |
| Wednesday .. .. | 18 | 2 | .. | .. | .. | 4 | .. | 4 | 4 | 16 | ½ | .. | ½ | ½ | ¼ | 1 |
| SCALE III. | | | | | | | | | | | | | | | | |
| (*For soldiers in arrest undergoing sentences exceeding forty-two days without hard labour*) | | | | | | | | | | | | | | | | |
| Sunday .. .. .. | 20 | .. | ½ | 8 | .. | .. | 2 | 3 | .. | 16 | ½ | ¾ | 1½ | .. | .. | .. |
| Monday, Thursday, and Friday | 20 | .. | ½ | ¼ | *8 | .. | 2 | 3 | .. | 16 | ½ | ¾ | .. | ½ | .. | .. |
| Tuesday and Saturday | 20 | 2 | ½ | .. | 8 | .. | 2 | 3 | 2 | 16 | ½ | ¾ | .. | 3 | .. | 1 |
| Wednesday .. .. | 20 | 2 | ½ | .. | .. | 4 | 2 | 3 | 4 | 16 | ½ | ¾ | .. | ½ | ¼ | 1 |
| SCALE IV. | | | | | | | | | | | | | | | | |
| (*For soldiers in arrest undergoing sentences exceeding forty-two days with hard labour*) | | | | | | | | | | | | | | | | |
| Sunday .. .. .. | 24 | .. | ½ | 8 | .. | .. | 2 | 3 | .. | 16 | ½ | ¾ | 1½ | .. | .. | .. |
| Monday, Thursday, and Friday | 24 | .. | ½ | ¼ | *9 | .. | 2 | | .. | 16 | ½ | ¾ | .. | ¼ | .. | .. |
| Tuesday and Saturday | 24 | 2 | ½ | .. | 8 | .. | 2 | | 2 | 16 | ½ | ¾ | .. | 3 | .. | 1 |
| Wednesday .. .. | 24 | 2 | ½ | .. | .. | 4 | 2 | 3 | 4 | 16 | ½ | ¾ | .. | ¼ | ¼ | 1 |

* Mutton on Thursdays only.

Thursdays and Saturdays, to increase the cheese ration by half an ounce. In each case the dietary was raised from Scale II. to Scale IV. allowance in regard to the respective items, neither the bread, oatmeal, potatoes, nor meat items being changed. The alteration increased the nutritive value of Scale II. as follows: protein from 120 to 125 grammes, fat from 52 to 58 grammes, carbohydrates from 470 to 479 grammes. Total Calories from 2,906 to 3,013.

The change proposed was not great: but its adoption was secured without difficulty, it was carried out at a minimum of expense, and with the least possible dislocation of existing arrangements. It was authorised by Army Order 140 of 1905, and is embodied in the current issue of "Allowance Regulations," 1907, paragraph 74. (See table, p. 564.)

(*To be continued.*)

# EXPERIMENTAL INVESTIGATION OF "SIMPLE CONTINUED FEVER."

By Lieutenant-Colonel C. Birt.
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Lieutenant-Colonel J. J. Gerrard has drawn attention to the wide prevalence of undifferentiated fevers in Malta (Journal of the Royal Army Medical Corps, ix., 5, p. 487, November, 1907). The admission-rate for "simple continued fever," 1897-1905, was 142·4 per 1,000 of strength per annum. In 1907 there were no less than 548 cases returned under this heading in the Mediterranean area. This high figure cannot be explained by the well-known fact that the *Micrococcus melitensis*, typhoid and paratyphoid bacilli may give rise to transient illness with trivial febrile symptoms, though a proportion of the cases may be due to one or other of these infections. Thus in Malta in 1905, out of 750 admissions for Malta fever 100 were first returned as "simple continued fever." ("Report of Mediterranean Fever Commission," part vii., pp. 136 and 158). In an epidemic of enteric fever about 50 per cent. of the attacks are atypical. But as only sixteen admissions for Malta fever and fifty-eight for enteric are recorded for the year 1907, it is clear that another cause is at work to account for the 548 attacks of "simple continued fever."

An important paper by the well-known Austrian Army Surgeon R. Doerr has appeared in the *Berliner klin. Woch.* for October 12th, 1908, on "A New Invisible Virus." In 1886 Pick described a three-day fever accompanied with severe head- and backache and pain in the lower limbs, exceptionally with vomiting and diarrhœa, sometimes with a polymorphous fugitive rash. It was prevalent during the hot and dry summer months in South Herzegovina and on the Dalmatian littoral, and disappeared entirely in the cold season. It occurred amongst the troops during their first hot weather, and became known to them as "Hundskrankheit," on account of the subsequent weakness and depression. In the official returns it was shown as "endemic gastric catarrh." The mortality was *nil.* Of late it has been a fertile cause of disability in the Austrian army, and the War Minister ordered a commission to investigate it. Doerr now makes a preliminary report. He states the illness is common in Italy, where it is known as "summer fever," "climatic fever," "summer influenza," or "malarial influenza." In thirty-five cases he abstracted 10 to

20 cc. of blood with which to make cultures; all proved sterile. Serum tests with typhoid, paratyphoid, and Gärtner's bacilli were negative. No protozoa were to be seen by dark ground illumination, or in stained films of the blood. He then resorted to experiments on man, justified by the fact the infection never ends fatally. He took blood from a patient in Herzegovina on the first day of the illness, allowed it to clot, and despatched the serum to Vienna, where the disease was not endemic. Though the serum was three and a half days in transit, 0·5 cc., injected under the skin of his assistant, Dr. Raubitschek, induced a typical attack eight and a half days later. A second experiment with 1 cc. of blood subcutaneously resulted in fever on the fourth day. Blood drawn forty-eight hours after the onset of pyrexia was no longer virulent.

He concluded, therefore, (1) that the virus circulates in the blood on the first day of the fever and that it is also present in the serum; (2) that the blood is no longer infective at the end of the second day; (3) that the virus is resistant and retains its infectivity for three and a half days.

He next took blood from a patient during the first day of the attack, mixed it with physiological salt solution, and filtered some of it through a Berkefeld-Nordtmeyer candle and the rest through a Reichel filter. Two soldiers injected with the respective filtrates developed the disease six days later, though stationed in a non-endemic district.

Taussig had previously noted that stations at a high altitude were free from "Hundskrankheit" and that fresh cases appeared only in the first seven days after transfer from an infected area; dissemination by contagion or through excreta was thus excluded. He was inclined to attribute the diffusion to a species of Diptera known locally as "Pappatici," which are a veritable pest during the hot weather when the fever prevails. Doerr took up this clue. Twice only after many failures did he succeed in infecting men by these flies which had been fed on "Hundskrankheit" patients and conveyed to a healthy locality. He improved his methods of caging, and in a second series of experiments four persons contracted the illness out of eight on whom infected flies had fed. As in the case of yellow fever, the virus must undergo some development in the insect's body, for he found that the "Pappatici" did not become infective until eight days after biting a "Hundskrankheit" patient.

The "Pappatici," or *Phlebotomus papatasii*, belong to the family *Psychodidæ*. The genus *Phlebotomus* is characterised by the body and wings being densely clothed with long hairs, which gives the "owl midge," as it is sometimes named, somewhat the resemblance of a minute moth. The antennæ, palps and legs are long. The proboscis is straight and projects vertically beneath the head. The abdomen of the female is red when distended with blood. It is very small, 1·5 to 2 mm. long, of active and nocturnal habits. Only the females are blood-suckers. The larvæ live in water and rotting vegetable matter. They are cylindrical, with a short terminal stigmatic tube. The pupæ have two long tube-like anterior stigmata. Phlebotomus occurs in tropical and sub-tropical climates; Austen does not include it in his "British Blood-sucking Flies." It is found in Southern Europe and the Mediterranean, in Egypt, West and Central Africa, South America and India. Giles states Phlebotomus is most pestilential in the Himalayas during the rains and is equally as troublesome in the plains. This fact may explain the prevalence of short fevers of uncertain origin, 2,553 cases of which appear in the British Army Indian returns for 1907, which entailed a loss of 36,600 days service. In India and Egypt, Phlebotomus is often styled incorrectly a "sand-fly." Rondini says that *P. papatasii* is found on the higher slopes of hills, as well as in marshy districts. He has observed that the males are often abundant on the windows, the females less so. Giles gives an engraving of Phlebotomus on page 5 of the second edition of his well-known work on mosquitoes. Grassi has published a monograph on the genus ("Ricerche sui Flebotomi," Roma, 1907). Doerr observed that there were few culices and no anopheles in the summer at Mostan and Trebinje, where the fever was very prevalent, but that there were swarms of *P. papatasii.* He experimented with bugs without success. He concludes that the Dalmatian and Herzegovina three-day fever is caused by an invisible virus conveyed by *P. papatasii.*

Doerr's researches recall to mind those of Ashburn and Craig on 800 cases of dengue at Manila (*Journal of Infectious Diseases,* June 15th, 1907, p. 440). Their results were as follows: No micro-organisms can be demonstrated in fresh or stained blood specimens. The red blood count is normal, and there are no morphological changes in the red or white cells. There is leucopenia, with a relative increase of lymphocytes. Blood cultures are sterile. The intravenous inoculation of dengue blood, either filtered or unfiltered, induces the disease in man. The cause of the disease is, therefore, probably ultra-microscopic. Dengue can be transmitted by *Culex fatigans,* which is probably the common mode of transmission.

The incubation period of experimental dengue averages three days and four hours. Dengue is not a contagious disease, but is infectious in the same manner as yellow fever and malaria. Certain individuals are immune to dengue.

The points in common between "Pappatacifieber," as it is now known in Austrian army returns, and dengue cannot be overlooked, but the identity of the two diseases is not complete, Doerr's claim for the discovery of a new invisible virus appears substantiated. The list is growing apace; foot-and-mouth disease, horse sickness, hog cholera, rinderpest, pleuro-pneumonia of cattle, yellow fever, are all due to some agent which can pass through a Pasteur-Chamberland filter, and is therefore invisible.

We must now point out the resemblance between "Pappatacifieber" and the Mediterranean "simple continued fever." In the first place we note, on referring to the charts of seasonal prevalence of "simple continued fever" in Malta ("Report of Mediterranean Fever Commission," part vii., p. 140), that it is a disease of the summer months like "Pappatacifieber." Secondly, we note that it occurs chiefly among troops during their first hot weather ("Report of Mediterranean Fever Commission," part vii., p. 142), thus agreeing with the incidence of "Pappatacifieber" mentioned previously. Thirdly, the charts given by Gerrard [on p. 490 of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, November, 1907, are similar to those of "Pappatacifieber."

The loss to the army during the year 1907 in the Mediterranean area was nearly 6,000 days service. An experimental investigation is then of economic importance. A small monetary solatium would in all probability induce a number of individuals to submit to the inoculation of a virus which causes no more disastrous effects than three days fever. By this means the etiology of the disease would be unfolded, rational preventive measures could be carried out, and considerable financial loss prevented.

# ON THE APPLICATION OF HEAT FOR THE PURIFICATION OF WATER, WITH TROOPS IN THE FIELD.

By Lieutenant-Colonel R. H. FIRTH.

*Royal Army Medical Corps.*

The difficulties in connection with the supply of safe water to troops in the field are well known. These difficulties are the outcome of the necessary attempt to accommodate the three more or less irreconcilable conditions of quantity of water, quality of water, and simplicity with efficiency of purification method. The quantity of water to be supplied daily to soldiers in the field may be said to be not less than half a gallon per man, while the quality must be such that it will not produce disease. The real difficulty centres round the third condition, or question of method by which the first two are to be attained. Of purification methods, we have the choice of three, namely, the use of chemicals, the employment of filters, and sterilisation by heat. The first or chemical method may, without prejudice to future developments, be dismissed as being not generally practicable at the present time ; filtration has been much used in the past and even now is a well-recognised procedure, but its success has been relative rather than absolute. Of sterilisation by heat it may be said that it has never been seriously tried on a large scale, and it is the purpose of this article to review the position, indicating what progress has been made in developing this method, and pointing out on what lines the procedure offers reasonable success on field service.

The most elementary means of purifying water by heat is to subject it to boiling in ordinary open vessels. For the purposes of field service this procedure is impracticable, being crude, slow, extravagant of fuel, and rendering the water often flat or unpalatable; at the same time, it fails to remove the disabilities attaching to water heavily loaded with suspended matter. These facts compel us to recognise that, if heat is to be employed in purifying water, we must employ for the purpose special apparatus designed to secure at once rapidity in delivery, safety and palatability in quality, with economical expenditure of fuel. A variety of apparatus has been produced to attain these objects, the more notable being the Vaillard-Desmaroux machine of the French, the Hartmann of the Germans, and the Forbes apparatus of the Americans. In all of them the water is brought to ebullition, and the subsequent cooling and economisation of fuel obtained by causing the water to circulate through a recuperator or heat-exchanger.

The crucial defect of all these types has been that the volume of water which they could sterilise in the hour has been small in proportion to the weight and complexity of the apparatus. To P. G. Griffith the credit is due of first recognising that the lethal temperature for the causative organisms of ordinary water-borne disease is 82° C., the period of exposure being but a fraction of a minute; he further devised a thermostat or valve which prohibits automatically the passage over of water that has not been subjected to the critical degree of heat.[1] These principles were utilised in the production of the small water steriliser which came into our hands in the summer of 1906, and which has been tested practically in various encampments at home and abroad.[2] Satisfactory as these small sterilizers were, it was soon apparent that they required much further elaboration and finish before they could be utilised generally in the Service, more particularly for moving columns. The following year saw the production of a larger type on wheels, which has been severely tested with field troops at Aldershot during the last two training seasons. While the original small machine gave but 60 gallons of water per hour of a mean temperature of 10° above that of the ingoing water, at an expenditure of 1½ pints of oil fuel, this larger machine delivers 350 gallons hourly of the same coolness, at an expenditure of 1 gallon of oil for each 480 gallons of water sterilised. In 1907, this apparatus was tried with both the First and Second Divisions during divisional training, and again on command manœuvres. On the first occasion it was able to supply and fill the ordinary water-tanks of one and a half brigades of infantry or six weak battalions. This meant the filling of twelve tanks twice a day, or, roughly, 2,400 gallons of water. Located on the banks of a brook in the charge of a detachment or water squad consisting of a serjeant and five men of the Royal Army Medical Corps, this steriliser served as a water depôt from which the various regimental water-tanks were filled, these latter being in sole charge of the driver of the horses, who had merely to bring his tank in suitable proximity to the steriliser for filling. On the second occasion the same satisfactory results were obtained; in this case it was the purifier of water for two brigades of field artillery and two squadrons of cavalry. On command manœuvres in Buckinghamshire it was sent with the 5th Infantry Brigade; on this occasion its utility was not well shown, as several of the camps were supplied from standpipes connected with a public main. During the present year the same machine was used successfully with the 6th Infantry Brigade during divisional training. In the course of these trials notable defects both in design and workmanship had been realised, the more important of these being bad balance, insufficient capacity for storage of sterilised water, and defective heating appliances. Fortunately, when coming home from divisional training in July this year the frame, or chassis, on which the steriliser was mounted snapped. This afforded us a chance to remodel the whole apparatus and reconstruct on lines which experience had shown to be desirable.

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[1] Griffith: "Heat as a Means of Purifying Water," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. vii., p. 226.

[2] Firth: "The Griffith Water Steriliser," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. vii., p. 218.

FIG. 1.—Experimental Type of Water Steriliser at Work.

In its original form the storage for safe water was limited to 50 gallons contained in an iron tank in front. On reconstruction this was discarded, the various parts were rearranged, and the additional space rendered available utilised for carrying a 400-gallon canvas storage tank with standards, an increased supply of oil fuel, and a convenient box for tools and spare parts. The canvas tank folds up into a space measuring 20 by 8 by 6 inches, and, contained in a canvas bag, weighs but 30 lb. The oil fuel carried by the original machine was only 4 gallons; in its present form it carries 20 gallons. Advantage was further taken to substitute a more powerful burner for that originally used. The general appearance of the steriliser in its new form is shown in the accompanying fig. 1, which illustrates the detachment at work on the banks of a small ditch from which water is being drawn, passed through the steriliser, and stored in the canvas tank alongside. Water-tanks coming for a supply are filled from the storage tank, which again is constantly being refilled by the machine. Thus remodelled, the steriliser was sent on command manœuvres this year in the Meon Valley, where it served for two days as the water depôt to an infantry brigade, and on the other days in a similar capacity to a mounted brigade. On no occasion did it fail to meet the demands made on it; in fact, had more storage tanks been available it could have supplied more water than was actually wanted. The detachment working the steriliser both during divisional and command training was supplied from the Royal Army Medical Corps, and consisted of Serjeant Muirhead with Privates Shields, Jordan, and Lloyd. All these are trained men from the School of Sanitation, and the success with which they adapted themselves to the circumstances demonstrates the ability of the Corps to furnish technical *personnel* for water duties of this kind.

The question now arises, what inferences can be drawn from our experiences with this apparatus during the last two training seasons at Aldershot? The answer is that, given a suitable machine or steriliser, water can be purified by heat under field service conditions. On this point we need have no doubt, but the system must be that of establishing water supply depôts for each brigade, or approximately, one steriliser to each 3,000 men. If utilised as a brigade unit, sterilisers of this or similar type can be made to constitute the base on which the whole water service of the brigade could rest. Their utility need not be limited to meeting the demands for safe water from their own brigades only, as, once located where water is to be obtained, water-tanks from the most diverse units will find it convenient to use the source most accessible at the time. This occurrence was well exemplified at West Meon during our recent manœuvres, when, during one evening and night, water-tanks from two brigades and divisional troops indiscriminately used the steriliser and its storage tanks as the nearest and most convenient source of supply. The employment of heat sterilisers on this basis permits of the withdrawal of special water squad men with individual water-tanks, as they would have no technical apparatus attached to them; it involves merely the need of one water squad of trained men with the steriliser itself. This squad can be limited to one N.C.O. and three men. As a unit with a brigade, its daily location at any convenient source of water supply will be essentially a question for the brigadier, as the disposition of his command might demand. Its location, marked by the usual watering-place flag, would be the rendezvous for all regimental water-tanks requiring to be filled.

Feasible as the scheme thus outlined undoubtedly is, its efficiency depends absolutely upon the provision of suitable apparatus. Have we such a steriliser? No, we have not; for the machine with which our experiences have been gained is but a mere experimental type. It presents glaring defects both in workmanship and design, but it none the less indicates the lines on which we can advance; and the most pressing need now is the provision of funds for the building and perfection of a type which will meet the requirements of field service. The essential features of a field water steriliser are the following: (1) It must be self-contained; by this is meant that it should present not only the means whereby water can be rendered safe, but carry storage tanks for at least 600 gallons of water, and afford also accommodation for the carriage of the personal equipment of the detachment serving it and blankets for the horses required for its traction. (2) It must be able to burn either coal, wood, or oil as fuel. (3) It must be so designed as to be portable, and present as dead weight, apart from the carriage on which mounted, a load not exceeding 1,500 lb., this load including the weight of the horse blankets, men's equipment, spare gear, hosing, and oil fuel. If so designed, such a steriliser could be drawn by two horses. Given four horses or self-propelling power, then the load could be increased to 2,800 lb., and the whole apparatus enlarged.

The accompanying fig. 2 shows the side view of how we think a suitable steriliser should be constructed. It consists of two main parts, a small wagon or cart in front with the steriliser limbered in rear. This vehicle is an authorised type made in the Royal Carriage Factory at Woolwich. In the fore part or wagon would be carried a tent, two troughs with their standards, each capable of storing 300 gallons of water, various tools or spare parts, camp kettles, 30 gallons of oil, 60 feet of canvas hosing, blankets and rations for the detachment, forage and blankets for the horses, picketing gear, together with a flag and pole for indicating

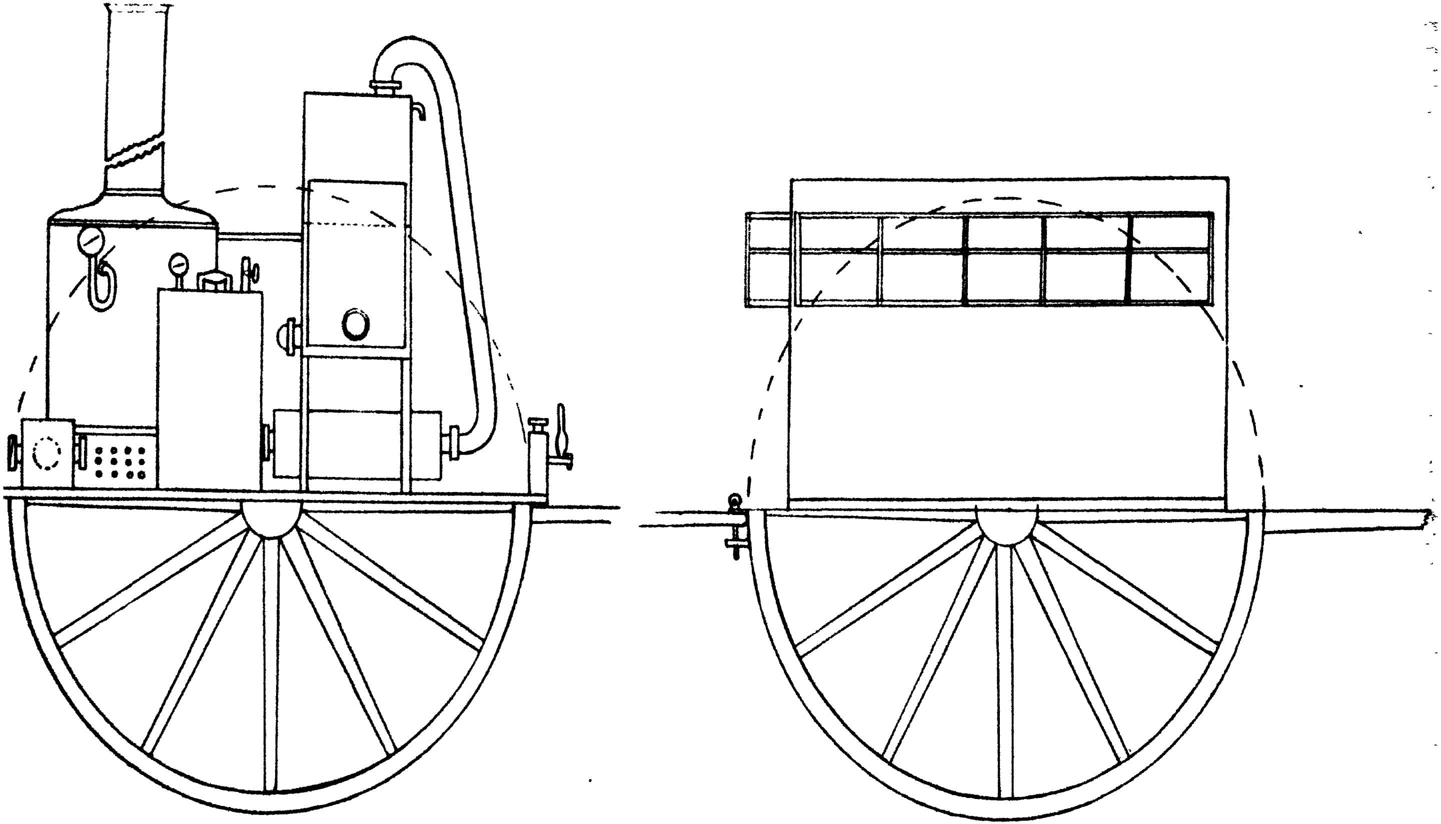

FIG. 2.—Side View of Suggested Type of Water Steriliser.

available water. The approximate weight of this load would be 700 lb. The steriliser itself is shown limbered in rear, and consists of the following essential parts, which are shown in detail in fig. 3: A is a water-tube boiler, capable of raising steam to 300 lb. per square inch from dead cold in eight minutes; B1 is a supply tank and heat exchanger combined; B2 is a sterilising chamber, in which the water is heated to the desired temperature by means of steam from the boiler circulating in coiled tubes; B3 is an automatic valve or thermostat, controlling the circulation of water under treatment; C is one of a pair of clarifiers for clarifying muddy water, and D is one of a pair of pumps, working by steam supplied from the boiler; E is an oil reservoir, should oil fuel be needed; a small hand pump for preliminary filling of the boiler is also supplied and marked F.

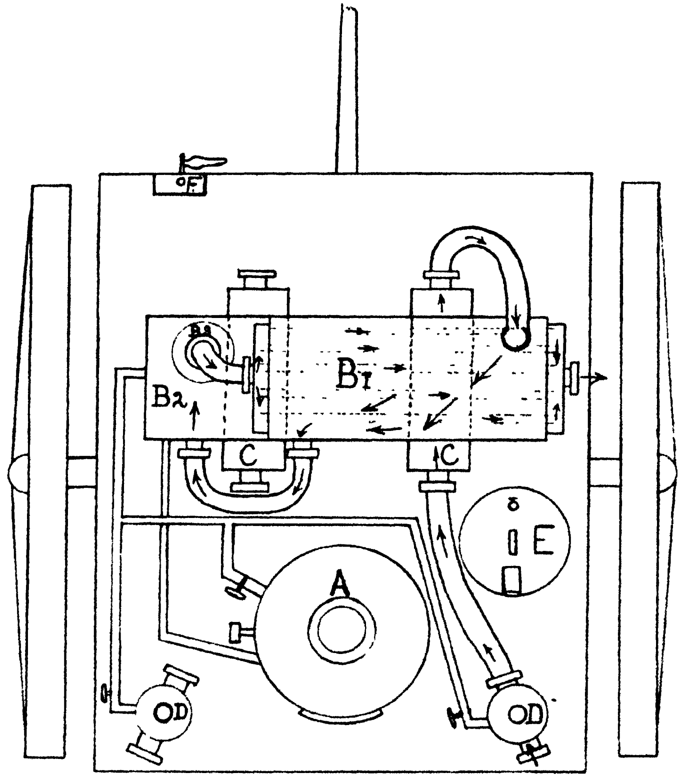

FIG. 30 — Showing Plan of arranging Essential Parts of Suggested Water Steriliser.

The weights of individual parts would be : boiler, 180 lb. ; supply tank, cooler, and sterilising vessel, 250 lb. ; the pair of steam pumps, 245 lb. ; the pair of clarifiers, 60 lb. ; the oil reservoir, 10 lb. ; and the hand pump, 20 lb. These give a total weight for the rear load or steriliser proper of 765 lb., or roughly 800 lb. The delivery of purified water from this apparatus should be 400 gallons in the hour. The weight of the front cart, wheels, and platform on which the steriliser is mounted would be 1,350 lb., or say 12 cwt., making, with the equipment carried in cart, the total load behind the horses 2,850 lb. or, say, 26 cwt., which is not excessive for two horses.

It will be apparent that a steriliser designed on these lines is self-contained, and enables the detachment working it to act as an independent unit if occasion demands. Our experience at Aldershot emphasizes the need of this, as there are times when the detachment may be " in the air " and away from its own brigade. If this occur, the N.C.O. as commanding the detachment has all essentials with him, having merely to indent on the nearest supply depôt for his men's food and horses' forage. This actually occurred in our last manœuvres, but, thanks to the initiative of Serjeant Muirhead, no difficulties followed. This arrangement makes the whole installation "elastic," a very important matter.

It is not implied from the foregoing statements that they represent the only form which an ideal steriliser would or should take. Our experience indicates clearly that the adoption of the limber design affords the maximum accommodation for equipment with maximum stability and facility of transport of the steriliser itself. We all know how facile a field gun is over rough ground; designed on these lines, a steriliser would be equally handy. In awkward localities, the steriliser could be unlimbered and run by hand into position, while its limber cart remains in convenient proximity to meet the needs of the machine and its detachment. Whether the accompanying figures represent the best arrangement for the working parts of the steriliser is another question. We do not claim that they do, but time and space have precluded the giving of alternative designs. Importance is, however, attached to the utilisation of steam from a small high pressure boiler for heating the water to be purified, as the same boiler supplies concurrently energy for pumping—one of the most exacting calls on the detachment. One of these steam-driven pumps will keep up the supply of crude water to the steriliser while the other will fill carts from the storage tanks as needed; the water flowing from the steriliser to the storage tanks by gravity, as in our existing machine.

One of the most difficult questions associated with the production of a field water steriliser is that of weight. In the suggested type now under consideration, the limit of 800 lb. has been adhered to, or, rather, not exceeded, by cutting down to a minimum the size and weight of the heat-exchanger, which is always the heaviest part of apparatus of this nature. To appreciate what this involves we must consider what is the prime object of having a heat-exchanger at all. The heat-exchanger serves a double purpose: it enables the outflowing water to be cooled, and at the same time, by giving heat from the treated water to the incoming or untreated liquid, economises fuel. Any interference with the size and arrangement of this portion of the machine means that the outgoing water will not be cooled down and the incoming water will not be sufficiently heated on its way to the central heater to secure fuel economy. Experience shows that using these sterilisers in the manner explained as water depôts, there is no real need for the outgoing water to be cold or even much cooled. Stored in the tanks, it rapidly cools, and, if cooled and placed in the regimental water-tanks in a hot sun, becomes warm again. The conclusion we form on this point is that for practical purposes the water can be allowed to issue from the steriliser more or less warm, and be productive of no inconvenience. There remains only the question whether the weight of an elaborate heat-exchanger is justified by its saving in fuel and increase of delivery. Speaking for ourselves, we do not think that the extra weight is worth carrying, and, in the suggested type, have made a compromise whereby the principle of heat-exchange is utilised as far as possible to secure maximum delivery, but clearly on the understanding that the outflowing water will be appreciably hotter than the ingoing.

Sufficient facts have been submitted to show how far we have advanced in this matter of utilising heat for the purification of water with moving columns and what are the lines on which we should progress further. But before we can so progress we must have suitable sterilisers. In regard to the possibility of devising suitable types, sufficient has been said to show that the problem presents no real difficulties. One need not dwell on the saving in technical water *personnel* which their general adoption would mean. The only point worthy of serious consideration, in that it is suggestive of transport difficulties, is that each steriliser means two horses. It is not beyond the ingenuity of man to make such a steriliser self-propelling, self-sterilising, and self-pumping. But assuming an automobile steriliser is too Utopian to be seriously considered, is it too extravagant to say that two horses supplied for traction per brigade are merely an equivalent set-off to the saving of sixteen men per brigade employed on water duties? Personally, we think not, and urge that this view of the question be not lost. The fuel question is another point which suggests difficulties to some. In the field, the only likely fuels are wood or oil; of the two we have a predilection for oil. Its supply in a civilised country would be easy, and in a non-civilised area not impossible. The development of mechanical transport for field troops is rapid, and the supply of liquid or solid fuel for it has been no bar to its increasing employment. Why anticipate exceptional difficulty for water sterilisers? With 400 gallon types of machine the average daily expenditure of oil fuel may be put at five gallons, and each apparatus should be able to carry six days' supply. Obviously, the supply service will have to adapt itself to the newer demands, and issue mineral oil in suitably shaped two-gallon tins, as petrol is supplied. There must be an end to kegs and awkward tin utensils for carriage of oil, such as are so much in evidence under present conditions.

Assuming that heat sterilisation of water be accepted as a workable scheme for field troops, what will be our requirements in this respect? Our experience indicates that the brigade or *cadre* of 3,000 men affords the most economical basis on which to organise such a service. This means four sterilisers and sixteen men in charge thereof for a cavalry division; five sterilisers and twenty men for an infantry division with divisional troops, these being allocated thus: three for headquarters and the three infantry brigades, one to divisional artillery and ammunition columns, while one will be needed for combined requirements of divisional engineers, supply and field ambulance units. For army troops, three sterilisers and twelve men doing duty therewith will be sufficient. This gives a total need, for one cavalry division, six divisions and army troops, of thirty-seven sterilisers and 148 men constituting their working squads. Under existing conditions we have need of 699 men for water duties with the same field force of 135,430 of all ranks. The price of this liberation of 551 technically trained men is the demand for 74 extra horses, or, allowing for equine casualties, say 100 horses. The average price of each steriliser would be £200, or the whole thirty-seven, sufficient for an expeditionary force of 135,000 men, would not cost £8,000.

So much for the possibilities of purification of water by heat in the field army; what is the situation on lines of communication? Here, the heat method pre-eminently holds the field to the exclusion of all others, and is officially recognised as the most economical procedure. The difficulties in the way of getting a suitable type of steriliser for fixed posts are small, and, without entering into exact details, attention is directed to fig. 4, which shows a new type of steriliser for use in barracks or permanent camps. Measuring 4½ feet in height, 4 feet in width and 1½ feet in depth, the apparatus consists of three main parts: (*a*) a heating vessel with furnace beneath it; (*b*) and (*c*) two heat-exchangers or coolers. The water does not circulate unless a temperature of 82° C. is maintained in the heating vessel.

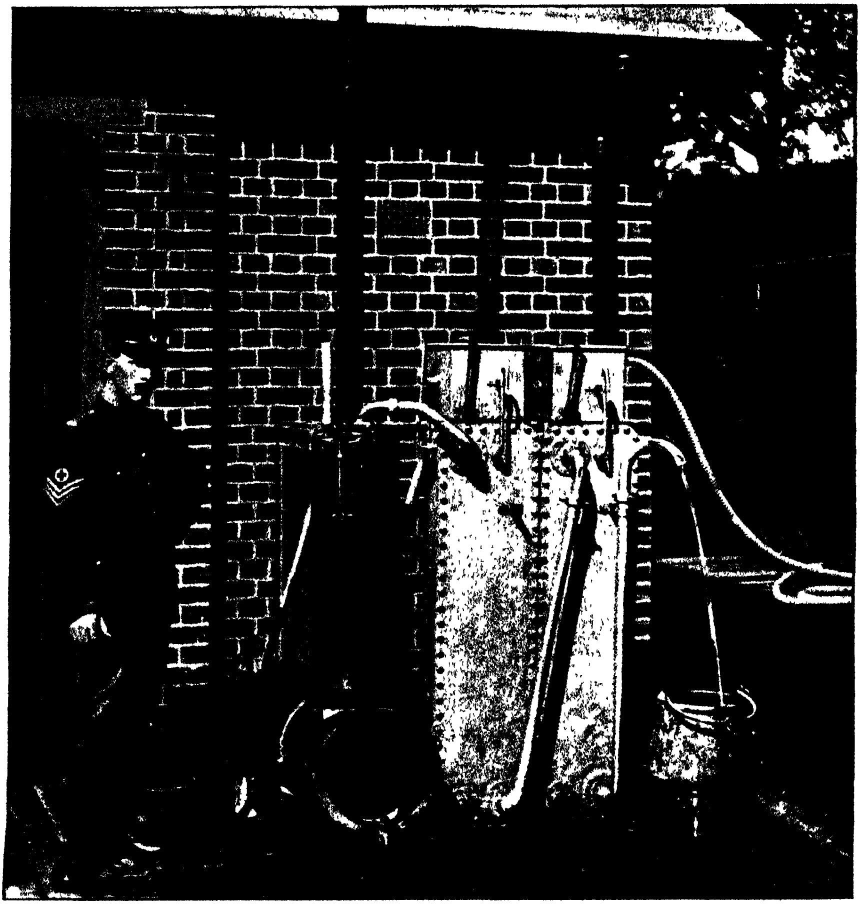

FIG. 4.—New Type of Water Steriliser, suitable for Fixed Camps or Barracks.

This steriliser can be used with either one or both of the heat-exchange sections, and can be worked with coal, wood, or oil as fuel. With coal as fuel, the delivery is 150 gallons an hour with one cooler, rising to 220 gallons when both heat-exchangers are used. It has been found that 28 lb. of coal are sufficient to work the steriliser for four hours, or a total delivery of 600 gallons with one cooler, and 850 with two coolers, on this amount of fuel. With wood as fuel, the average consumption is 20 lb. an hour, yielding 180 gallons with one cooler and 220 gallons with two coolers in that time. Fifty pounds of wood will give from 500 to 600 gallons of water. When oil is used as fuel, similar results are obtained, the average consumption, at 10 lb. pressure, being one gallon for each 450 gallons of water.

We anticipate a great future for well-made sterilisers of this kind, especially in fixed camps and posts, their great advantage being rapidity and economy. The economy is particularly marked with oil fuel. The object of this article, however, is not to call attention to the possibilities of heat methods at fixed posts or camps, but rather to direct attention to their wider application, more especially indicating what has been and can be done by applying the same to the requirements of moving columns. We are disposed to think that as the capabilities of these sterilisers are more widely understood, their gradual use with field troops is bound to come. But before we can do this we must have experimental types made; hitherto, no serious attempt has been made to supply them, but we urge that the time has come for these to be constructed, and for the ideas here put forward to be tested practically. One may be unduly optimistic, but, speaking for ourselves, we are convinced that the real solution of the water problem will be found on the lines here indicated.

# United Services Medical Society.

## THE MICRO-ORGANISMS OF DYSENTERY.

By Major ROBERT J. BLACKHAM.
*Royal Army Medical Corps.*

Much has been written on the causative agents of dysentery, but as most of the accounts of these organisms are far from complete, it may be interesting to summarise our present knowledge of this interesting subject. It is hardly necessary to point out that, notwithstanding the fact that dysentery is still shown without any subdivision in the new issue of the nomenclature of diseases, the clinical entities known for centuries under this name are not one disease, but a group of maladies of very varying degrees of severity, ranging from the acute dysentery so familiar to those of us who have served in tropical or subtropical countries, to the simple infective diarrhœa which occurs in infants and adults in temperate latitudes. This latter, which has hitherto been regarded as "simple diarrhœa," may be, and often is, caused by the bacilli of dysentery, as has been shown by the work of Duval and Bassett and other investigators. The dysentery group of diseases is remarkable as the only one in which two distinct maladies caused, in the one case by a group of bacilli, and in the other by a member of the animal kingdom, have been, until comparatively recently, hopelessly confused by climatologists, and are still actually included under one heading in all official statistical returns.

Proceeding on biological lines, I shall first consider the organisms associated with the name dysentery and derived from the vegetable kingdom.

### Bacillary Dysentery.

The organisms which produce this type of disease belong to the coliform group of bacilli. The honour of first isolating a pathogenic bacillus from the stools of dysentery patients belongs to Shiga, but since his researches, published in 1898, a number of organisms which have been demonstrated to be causal agents of the disease have been found by observers in various parts of the world.

I have had the opportunity of working with a considerable number of these organisms, and in December, 1906, published the result of some experiments with six strains of the bacillus. Sir

Patrick Manson has done me the honour of publishing the table summarising my work in the last edition of his invaluable treatise on tropical diseases (pp. 436-439), but as the result of further investigation I consider that the time has arrived to abandon the cumbrous nomenclature associated with the names of individual observers and to group the bacilli of dysentery under two headings, viz.:—

(1) Type "A," including the organisms discovered by Shiga and Kruse; and (2) type "B," including the organisms isolated at Manila by Flexner.

It will be found that all organisms, including the bacillus isolated by our French comrade M. Vaillard, will fall into one or other of these groups.

To economise space and for purposes of ready reference I have prepared the attached modification of my original table, which, I think, shows clearly the morphological and cultural characteristics of the dysentery organisms and their resemblance to and difference from the other members of the coli group of bacilli.

The following points merit brief special reference: (1) Flagella; (2) sugar media; (3) agglutination; (4) vitality; (5) clinical bacteriological examination; and (6) evidence of pathogenicity.

*Flagella.*—The dysentery organisms were at first considered to be non-motile, and most of the earlier monographs stated that although Brownian movements are marked flagella are not present. It is, however, now recognised that the bacillus is always motile when recently recovered from the stools, and only loses its motility in sub-cultures. Vedder and Duval were the first to demonstrate, by a modification of van Ermergen's process, that the bacillus "possesses a number of lateral flagella of great fineness but considerable length." These results have been confirmed by Birt and Eckersley,[1] who have demonstrated flagella in eight strains of the organism. The best method of demonstrating flagella is Stephen's modification of van Ermergen's. The following is a description of this method: Three solutions are required, viz., A, B, and C. "A solution" consists of osmic acid, 2 per cent., 1 part; tannic acid, 10 to 25 per cent., 1 part. "B solution" consists of nitrate of silver, 1 per cent. "C solution" is composed of 5 per cent. gallic acid solution and 5 per cent. solution of ammonia, equal parts; this solution is best prepared immediately before

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[1] "The Flagella of Dysentery Bacillus," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. iv., p. 18.

## TABLE SHOWING THE MORPHOLOGICAL AND CULTURAL

| Micro-organisms | Character | Motility | Flagella | Growth on nutrient agar | Gelatine stab | Peptone and salt |
|---|---|---|---|---|---|---|
| (1) *Bacillus dysenteriæ* (Type "A") | Short rod with rounded ends; no spores. Length, 1-3 μ. Young cultures are very short, often show irregularity of staining, often arranged in clumps or short chains | Motile in recent cultures from stools, gradually loses motility in sub-cultures | 2-6 μ. Mostly terminal; rather short and thick | Semi-opaque; resembles the growth of *B. typhosus*, but is more transparent. Has a characteristic odour, called by the Germans "Spermgeruch" | Similar to (4); but film which spreads out from puncture usually absent. Growth not seen till 48 hours, and then only slight white growth | Faint haziness, which rapidly clears; no indol |
| (2) *B. dysenteriæ* (Type "B") | Ditto .. .. | Ditto .. .. | Long, thick and terminal | Ditto .. .. | Ditto .. .. | Indol produced |
| (3) Pseudo-dysenteric bacillus | Generally somewhat larger than true dysentery bacillus | Ditto .. .. | Variable .. | Ditto .. .. | Ditto .. .. | No indol .. |
| (4) *B. typhosus abdominalis* | Longer than either *B. dysenteriæ* or *B. coli*; oval ends | Sub-cultures always very motile | 8-12 μ .. | More opaque than those of *B. dysenteriæ* | Similar, but surface film usually present | Ditto .. |
| (5) Paratyphoid bacilli ("A" and "B") | Ditto .. .. | Not so motile as *B. typhosus*, but more so than *B. coli* | Variable .. | Ditto .. .. | Ditto . .. | Ditto .. |
| (6) *B. enteritidis* of Gaertner (*Enteritidis* Group) | Ditto .. .. | Similar to *B. typhosus abdominalis* | 8-12 μ .. | Ditto .. . | Ditto .. .. | Ditto .. |
| (7) *B. coli communis* | Shorter and thicker than *B. typhosus* | Motility is not so marked as *B. typhosus* | 2-6 μ .. | More opaque than *B. typhosus* | Whiter, thicker, more opaque, and showing gas bubbles | Indol production marked |

All organisms of the *Coli* Group are

## CHARACTERISTICS OF THE COLI GROUP OF BACILLI.

| Neutral red shake | Litmus milk | Sterile potato | Agglutination with dysenteric serum | Caffein medium of Roth | Sugar nutrose media | Agglutination with enteric fever serum | Salicin nutrose medium | Mannite nutrose broth |
|---|---|---|---|---|---|---|---|---|
| No appreciable change of colour | Becomes feebly acid after 4 days incubation; acidity has been estimated as equal to 6 per cent. decinormal alkaline solution. No clot | Transparent or whitish growth, which becomes brownish-red | Usually only agglutinates with serum from animal immunised by its own type of *B. dysenteriæ* | No growth | Ferments: dextrose and other mono-saccharides | *Nil* .. | *Nil* .. | Unchanged. |
| Ditto .. | Ditto .. .. | Ditto .. | Ditto .. | Ditto .. | Ferments: dextrose, saccharose and maltose, but not lactose | Ditto .. | Ditto.. | Ditto. |
| Ditto .. | Slightly acid at first, afterwards slightly alkaline | Ditto .. | Very variable | Ditto .. | Ferments: raffinose | Ditto .. | Growth and acid | Growth and acid. |
| Ditto .. | Slight acidity after some days | For several days apparently no growth; later slight pellicle with velvety surface | *Nil* . | Growth.. | Ferments: glucose and maltose | Agglutinates | Ditto.. | Ditto. |
| "A" usually no change; "B" sometimes fluorescent | Paratyphoid "A" produces acid like *B. typhosus*, and Paratyphoid "B' produces alkalinity | Variable .. | Ditto .. | Ditto .. | Ditto .. | Variable.. | Ditto.. | Ditto. |
| Similar result to *B. coli* | Transient acidity, followed by alkalinity | Similar to *B. typhosus* | Ditto .. | Ditto .. | Lactose is fermented by strains otherwise similar to 4 | Agglutinates, but in a lower dilution than the *B. typhosus* | Ditto.. | Ditto. |
| Canary yellow colour produced and gas bubbles | Marked acid and clot | In 48 hours distinct brownish film, which rapidly spreads and becomes thicker | Ditto .. | No growth | Ferments: glucose and lactose, but not saccharose | Appears to agglutinate with normal serum | Ditto.. | Ditto. |

decolorised by Gram's method of staining.

use. The technique is as follows: (1) Take a twenty-four hours agar culture of an actively motile bacillus. (2) Prepare a thin emulsion of the bacilli. (3) Spread on a clean slide. The slide is best cleaned by heating over gauze. (4) Fix by aid of gentle heat and stain in solution A for about half an hour. (5) Wash off thoroughly. (6) Add a few drops of B solution. (7) Knock off excess of stain but do not wash. (8) Add a drop or two of C solution. Allow the solution to remain for about a minute on the slide and then wash thoroughly. Repeat the procedure till a dark brown colour is produced. (9) Dry and mount. This procedure rarely fails, even in the hands of persons not very familiar with this line of work.

*Sugar Media.*—An alkaline preparation of casein called nutrose has been used by various German investigators and by an Austrian army surgeon, named Doerr, for preparing the special sugar media for differentiating the *Bacillus dysenteriæ* from the other members of the coli group. The formula for these media is: Mannite or special sugar 1 part, sodium chloride 0·5 parts, nutrose 1 part, water 100 parts. Dissolve nutrose and sugar or mannite by aid of heat and add 5 cc. of neutral litmus to each litre.

The reaction of the various members of the coli group on these special media is shown on the table (p. 584.)

*Agglutination.*—Shiga attached much importance to the agglutination of his bacillus with the blood of a patient suffering from the disease, and it was shown that a precipitate was given in dilutions as high as 1 in 200. The reaction is usually given during the first week of the disease, and from the seventh day onwards increases rapidly in favourable cases. As in enteric fever, the dilutions which give agglutination, if charted, show a curve which indicates the progress of the disease. If a steady rise is shown, the progress is favourable, but if the agglutination power of the blood remains stationary, or diminishes, the case usually ends fatally. The value of the test was greatly discredited of recent years until it became generally recognised that the serum of patients will only clump with bacilli of the type which produces the disease. The test should therefore always be applied with both types of the bacillus.

*Vitality.*—All varieties of dysentery bacillus are killed by a temperature of 60° C. in about half an hour. They are also very readily destroyed by disinfectants, 5 per cent. carbolic acid or 1 in 2,000 perchloride of mercury destroying them in from three to five minutes. Bacilli have lived on rags for twenty-one days, and Pfuhl[1] states that it will survive in soil for one hundred and one days. The organism has lived for fifty-five days in tap water at ordinary temperatures, and for eighty-eight days at a temperature of 37° C.[2] It has been recovered from milk after three weeks, from butter after nine days, and from fruit and vegetables after eleven days, so that the necessity for careful cooking of all food supplies during an epidemic is very apparent.

*Clinical Bacteriological Examination.*—Take a small quantity of the mucus and prepare a film in the ordinary way. In cases of dysentery it will generally be found that very few other organisms are present, and in this respect the dejecta differs very widely from normal stools or from those of enteric fever or cholera, which usually teem with various bacterial flora. To prepare cultures, transfer a small quantity of the mucoid material to about 5 cc. of sterile water. Shake up well and then seed out by sweeping a bent rod moistened with the fluid over MacConkey's agar placed in a Petri dish. Incubate at 37 C. for twenty-four hours. The colonies of *B. coli* will be readily excluded by the formation of acid, as the dysentery bacillus is not a lactose fermenter. All colourless colonies should therefore be transferred to nutrose-mannite and nutrose-sugar media for differentiation from other coliform organisms.

*Pathological Evidence of Specificity.*—The evidence of pathogenic effects of the various strains of this organism on man is, necessarily, somewhat small, but if not convincing it is certainly strongly presumptive. Strong reports a case in which a Philippine prisoner under a capital sentence was induced to swallow a culture of the organism. He died from acute dysentery, which set in forty-eight hours after swallowing the culture, but the value of this evidence is discounted by the fact that the disease was epidemic in Manila at the time. Shiga made an emulsion of one-twelfth part of an agar slope in sterile bouillon and had it injected into his own back. Slight pyrexia resulted and a small abscess formed at the site of the inoculation, but no diarrhœa resulted. Shiga's blood serum, however, showed active agglutination with the bacillus some days afterwards. Flexner records a laboratory accident in which one of his assistants aspirated a small quantity of fluid culture into his mouth. Notwithstanding prompt expectoration and the free use of a disinfectant mouth-wash, severe diarrhœa with bloody and mucous stools, tormina, and tenesmus, developed in forty-eight hours. On laboratory animals marked enteritis, chiefly affecting the large bowel and showing various pathological changes identical with those of dysentery, has been produced. The lesions are most marked in rabbits, young pigs and dogs. Horses react strongly to inoculation with the bacillus, and have been killed by a small dose. The channel of experimental infection which produces the best results is subcutaneous injections. "Ingestion with food by an œsophageal tube, after preliminary neutralisation of the gastric contents or exhibition of an irritant, has not been successful, while even the direct introduction of a pure culture into the small intestine after laparotomy in a dog produced no appreciable result."

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[1] Allbutt and Rolleston. "System of Medicine," vol. ii., part 2.

[2] Firth, R. H. "A Comparative Study of some Dysentery Bacilli," JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, vol. i., p. 486.

*Conclusions.*—We may take it as bacteriologically proven by various observers—

(1) That notwithstanding slight cultural differences the various strains of *B. dysenteriæ* isolated conform to what must be regarded as two types of the same organism. In addition to these pathogenic strains of the organism there may be isolated from the stools a bacillus which is non-pathogenic to laboratory animals, but is otherwise with difficulty distinguished from the true bacteria of dysentery. Whether, however, the bacillus represents a degraded or transitional form of the true bacillus it is, as yet, impossible to say.

(2) That symptoms and intestinal lesions identical with those found in man supervene after the subcutaneous inoculation of rabbits with the cultures of the various strains of *B. dysenteriæ*.

(3) That the dysentery organisms have considerable vitality. They will live on clothing for three weeks, and have maintained their virulence in soil even at a temperature of 1° C. for long periods. When spread on bread-crumbs, or similar articles of food, they survive for about a week.

(4) They are very readily destroyed by heat or by weak solutions of perchloride of mercury or of the higher phenols.

(5) The specific agglutination reaction with the serum of persons suffering from acute dysentery can generally be obtained within the first week following the onset of symptoms. It is of great value in the case of all patients suffering from a prolonged attack of diarrhœa, as it has been obtained in nearly all cases when the test has been applied with the type of bacillus isolated from the stools.

## AMŒBIC DYSENTERY.

Ascending the biological ladder, we find that the organism producing amœbic dysentery belongs to the animal kingdom, and has been placed by Leuckhart in the Rhizopoda class of the Protozoa, or one-celled animals. An amœba was first described by Lambl in 1859, and subsequently by Losch in 1875, but to Schaudinn is due our present exact knowledge of the genuine organism. He found that many kinds of amœboid organisms occur in the human intestine, and that some of these are not true amœbæ at all, but merely amœboid stages in the development of the higher forms of the protozoa, such as Trichomonas, Lamblia, and other infusorians. Genuine amœbæ he divided into two classes: (1) Those provided with a shell, the Thecamœbæ; and (2) those that have no covering, or Gymnamœbæ. "At least one of the former and two of the latter variety occur in the intestine." The two naked forms are genuine parasites, but one of them is harmless, and the other one of the most dangerous of pathogenic protozoa. Schaudinn has renamed the former, hitherto known as *Amœba coli*, the *Entamœba*, and the latter, known as the *Amœba dysenteriæ*, as the *Entamœba hystolytica*. He found the parasite in the excreta of about half the persons which he examined, and Schuberg afterwards demonstrated the fact that as the organism dwells in the upper region of the colon, by hurrying the onward passage of the fæces, the protozoon could nearly always be found in the dejecta of healthy persons.

The *Entamœba* has two well-marked methods of reproduction, one merely vegetable and the other clearly sexual in type. The asexual form consists in simple segmentation of the nucleus into eight parts, which surround themselves with protoplasm and separate into a "characteristic brood" of young amœbæ. In the sexual cycle of reproduction the organism comes to rest, contracts, and surrounds itself with a gelatinous coat which becomes the cyst wall. The nuclei, after undergoing reconstruction, divide, copulate, and then divide again, so that the parent nuclei eventually form eight young amœbæ which are enclosed within the cyst wall, and like the cysticercus of the tapeworm, cannot start in life on their own account until the cyst has been taken into the stomach of a new host and the gelatinous cyst wall dissolved by the intestinal juices.

The *E. histolytica*, as the *A. dysenteriæ* is called by Schaudinn, differs widely in appearance and mode of production from the non-pathogenic type of the organism. It has a clear tough ectoplasm and ill-defined nucleus, and Schaudinn considers this tough outer layer enables the parasite to force its way between the epithelial layers and submucosa, where it undergoes development, destroys the tissue, and thus forms the ulcers characteristic of dysentery. In support of this view he states that he has actually observed the protozoa forcing their way between the cells in the freshly excised bowel of a cat which had died of amœbic dysentery.

*E. histolytica* in its asexual form multiplies by simple fission or forms new amœbæ by budding; "the characteristic brood formation" of the non-pathogenic organism does not occur. The cystic stage is also produced in a different way, and it is of special interest to note that it is not formed till the patient is beginning to recover from his attack and the stools are becoming solid, a fact which is of the utmost importance in framing preventive measures against the disease.

The protozoon throws out from its surface a series of little knobs, about 3 $\mu$ in diameter, each containing a particle of chromatin. These knobs break off and, having developed a firm capsule, ultimately become hard, opaque little bodies called, for want of a better name, "spores." These bodies are expelled in the fæces, and on being taken into the intestinal tract infect a new host. An experiment of Schaudinn's seems to prove this conclusively. He allowed some of the fæces from a case of undoubted tropical dysentery to dry in air, and assured himself by careful microscopy that it contained nothing resembling the cysts of *E. coli*, but only the "spores" of *E. histolytica*. He took the material from the slides actually examined, and having made an emulsion with water, gave it in food to a healthy young cat, whose fæces had proved to be free from dysentery organisms. In three days the cat passed stools containing typical *E. histolytica*, and it died of dysentery on the fourth day. The autopsy showed typical dysenteric ulceration of the colon with entamœbæ "in all stages of penetration of the intestinal wall."

Schaudinn gave large quantities of fæcal matter from this case to another cat, but the animal remained healthy, showing that the amœboid form of the organism is innocuous. He then administered a little of the dried-up fæces containing some of the spore-like bodies from the tropical dysentery case, and the animal, which was larger and stronger than the first cat, developed dysentery in due course and died in a fortnight. Kruse and Paquale, as is well known, produced dysentery by the introduction of amœbæ *per* *rectum*, but McWeeney[1] points out that this rectal transference can hardly be realised under natural conditions. Whether the entamœbæ contained in the fæces from the acute stage will, if gradually dried, become converted into cysts outside the body is not clear, but it is obvious that the dejecta of dysentery must be prevented from getting access to drinking water or being conveyed by flies to food. The *E. histolytica* and Shiga's bacillus appear to be antagonistic, and both Schaudinn and Castellani[2] have failed to find them in the same bowel. This is a point which is of particular interest and importance to those of us whose duty it is to endeavour to place the diagnosis of intestinal fluxes on a more scientific basis. In this relation, as a point of practical interest in the laboratory, I may remind you that amœbæ can only be found in the stools within twelve hours after being passed, as after that interval they begin to break up. They are found most readily in the smaller pieces of the mucus. The organisms disintegrate with heat, so that films cannot be placed in the Bunsen flame. They should be dried in air and then placed for five minutes in Gulland's solution, which is made up as follows: Absolute alcohol, 25 cc.; pure ether, 25 cc.; solution of corrosive sublimate in alcohol (strength, 2 grammes in 10 cc.), 5 cc. The films should then be immersed in carbol-fuchsin for three minutes, washed vigorously in water for thirty seconds, and dried in air.

The method of diagnosing dysentery without the microscopic appearance of the stools is, I maintain, as unreliable as diagnosing the variety of malaria from the character of the fever alone. It is hoped, therefore, that this paper, which may be described as a plea for the more systematic examination of the dejecta of diarrhœa patients, may succeed in interesting medical officers more deeply in the microscopical diagnosis of the remarkable group of diseases which has been the scourge of armies in the field since the days of Agincourt.

## DISCUSSION.

Lieutenant-Colonel LEISHMAN said that, while quite realising the difficulty of condensing so complicated a subject, he thought Major Blackham's paper hardly left a fair impression of its great complexity, and of the uncertainties which still existed as to the number of these micro-organisms, and the part which they played in dysentery. These and other points were at present the subject of much debate, and it could hardly be said that the causation of the disease was quite so simple and so clear as might be gathered from the paper. In the case of bacterial dysentery a large number of varieties, types and sub-types had been isolated and described; many of them, however, differed only in respect of their fermentative reactions with various sugars, and he thought that there was a tendency at the present moment to place undue stress on these fermentative reactions; at all events, in the case of some of the strains which had been described, some of these reactions had been proved to be inconstant. Still greater uncertainty prevailed as to the number of species of amœbæ which might be encountered in normal or dysenteric stools and as to the association of some of these with tropical dysentery. The artificial cultures of these protozoa had shown that others existed beside the two described by Major Blackham. Schaudinn's work, too, was felt by many to stand in need of revision. A point of great practical importance seemed to him to lie in the fact that the preventive measures which had proved so successful in controlling the epidemic form of the disease were of equal value, whether the type was bacillary or amœbic.

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[1] McWeeney, E. J. "On the Relation of the Parasite Protozoa to Each Other," *Transactions of the Epidemiological Society of London*, N.S., vol. xxiv., 1904-5.

[2] Castellani. *Journal of Hygiene*, vol. iv., p. 508.

Dr. Macnamara, R.N., said that he had observed that in amœbic dysentery the ulcers caused were of considerable size and showed much undermining, while in the bacillary type the ulcers were much smaller and closely crowded together, and asked if the reader's experience tallied in these respects with his.

Lieutenant-Colonel C. Birt stated that he had isolated Shiga's bacillus in twenty-six cases out of fifty-five examined in Pretoria. Shiga's bacillus, so far as its inability to ferment mannite is concerned, is constant. A culture isolated in February, 1905, still leaves unchanged mannite-nutrose-litmus tubes incubated for a week. The ulcers in the South African cases were usually very large, with thickened, sloughing, excavated bases; unlike the condition Dr. Macnamara had observed in his cases of bacillary dysentery.

Major Blackham, in his reply, expressed his agreement with Lieutenant-Colonel Birt's remarks, and said that clinically his experience coincided with that of Dr. Macnamara.

The Chairman moved a vote of thanks to Major Blackham for his interesting paper, with which the proceedings closed.

# Clinical and other Notes.

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## MALTA FEVER FROM THE BLUE NILE.

By Lieutenant-Colonels R. J. S. SIMPSON, C.M.G., and C. BIRT.
*Royal Army Medical Corps.*

### Report by Lieutenant-Colonel Simpson.

On September 17th, 1907, I was asked to see a patient, an Englishman, recently returned from the Blue Nile, who was suffering from an ill-defined febrile attack, tentatively diagnosed by his medical attendant as influenza, but which from some associated circumstances had suggested the possibility of blackwater fever to his relatives. His history was as follows: He had been stationed at Rosaires during the past year, but had not had any illness there. He had a history of previous malaria, no history of dysentery. He left Rosaires on July 15th, Khartoum July 20th, Cairo July 28th, and Port Said July 31st, and proceeded straight to England without touching at Malta. He arrived in England on August 4th, and the earliest definite symptom of the attack, the fever, began on September 12th, though he had been out of sorts for a few days before.

Between September 14th and the 17th (when I saw him first), his temperature had ranged between 100° and 103° F., with general malaise, anorexia, headache, and a good deal of sweating. Beyond this there were no symptoms, the liver and spleen were within normal limits of size; there was no albuminuria.

The clinical features were then so indefinite that the necessity of a bacteriological diagnosis was obvious, and samples of blood were at once taken for examination, and the results are recorded by Lieutenant-Colonel Birt later. Malta fever was obviously a possible diagnosis. At Rosaires, he was in the habit of drinking goat's as well as cow's milk. He was unable to state whether the goats were Maltese or not. He gave no history of drinking goat's milk after leaving Rosaires. Thus, as the case turned out to be one of Malta fever, the infection probably took place at Rosaires, about sixty days before the onset of fever.

The patient had a severe attack, judging by the temperature chart, but beyond some muscular and neuralgic pains and insomnia, there were no complications. The four hourly temperature chart showed a definite wave between September 14th and 22nd, during which period the temperature never reached normal. Another wave, but not so well marked, lasted from September 30th to October 6th, a third from October 8th to the 20th, and a fourth from October 22nd to November 20th; in the intervals the temperature was intermittent, but came to normal at some period of the twenty-four hours. From November 20th to January 17th, the temperature was irregularly intermittent, there being a daily rise during this period, except on nine days, at irregular intervals. From January 17th, the temperature remained subnormal, except for a slight rise on February 3rd and 4th.

Treatment was entirely symptomatic. Specific (vaccine) treatment was discussed, but, from the difficulty of carrying it out satisfactorily (the patient lived sixty miles from London), it was not attempted. The patient made a good recovery, and when last seen (June, 1908) one could find no reason to object to his return to duty.

This appears to be the first case recorded from the Blue Nile, though evidence exists of a comparatively wide distribution, if not of great prevalence, in this part of Africa. Two points are worth noting; the first is the long duration of the fever and its severity, without the occurrence of any of the usual complications; the second is the prolonged latent period. The possibility of the attack being in fact a relapse of long period was considered, but apparently negatived by the fact that the patient, a distinctly intelligent and observant man, denied having suffered from any form of fever during his stay at Rosaires. Hence, if the attack were actually a relapse, the original manifestation of infection must have been of the most trivial nature. It is, of course, possible that this may have been the case; on the other hand, long latent periods are by no means unknown, and this, indeed, appears to be the explanation here.

### REPORT BY LIEUTENANT-COLONEL C. BIRT.

Blood abstracted during the middle of the second week of the fever failed in a 20-fold dilution to agglutinate the typhoid bacillus, but completely clumped in dilutions to 1,000 both a South African and Mediterranean strain of the *Micrococcus melitensis.* The emulsions were proved to be reliable by ascertaining that the serum of healthy individuals diluted ten times was without action on them. It is always necessary thus to control suspensions of this micro-organism, since growths may become auto-agglutinable, or agglutinable by indifferent sera after long cultivation on the usual laboratory media. The diagnosis of Malta fever could then be made, as it is the blood of those only who have acquired the infection that can clump an approved *M. melitensis* emulsion in dilutions of twenty and over. Blood films made on the same day confirmed the diagnosis. No malarial parasites were detected. There was no leucocytosis; thus liver abscess was excluded. In the differential leucocyte count it was found the polynuclears were 58 per cent. instead of the 65 per cent. of health. The most notable feature, however, was an increase of large mononuclears with faintly staining or invisible hyaloplasm. These amounted to 20 per cent—four times the normal proportion. The small lymphocytes were reduced from the normal 20 per cent. to

3 per cent. only. The deficiency was made up by non-granular mononuclears of medium size. In the experimental inoculation of guinea-pigs with the *M. melitensis*, Price Jones (*British Medical Journal*, vol. ii., 1905, p. 1113) has observed that there has occurred a like increase in the non-granular mononuclear cells of the bone marrow. Moreover, M. Signer (*Bull. de l'Inst. Past.*, April 15th, 1908, p. 299) has noted the augmentation of large mononuclears and the reduction of lymphocytes in the *M. melitensis* infection of goats. The rise in the number of large non-granular mononuclears has been observed also by Kennedy, Eyre, Hayat, Cathoire, Cardaliguet, and Schoull. It may become of diagnostic importance in those cases of Malta fever in which the agglutinative power of the blood remains low, and where isolation of the coccus from the blood has not been effected. There is a case of an officer who has been under our observation for three weeks, invalided from Kassala in the Sudan with Malta fever, in which the clinical symptoms and the presence of this large mononuclear increase alone support the diagnosis, as his blood does not agglutinate any strain of *M. melitensis*, nor has blood culture been successful since his arrival in England.[1]

In the fourth week the agglutination curve had ascended from 1,000 to 2,500, and it was hoped that convalescence would ensue. The intensity of the blood reaction is an index of the progress of the immunising processes going on in the body. At the end of the fifth week, however, there was a drop from 2,500 to 1,600, followed by a further fall eight days later. The clot of this specimen of blood (about $\frac{1}{10}$ cc.) inoculated on a glucose-nutrose agar slope gave a pure growth of *M. melitensis* in seventeen days time. With the former samples no success had been attained. In making cultures of the blood received in capsules for serum testing, it is wise to keep the tubes under notice for three or four weeks. Should there be but few microbes in the interior of the clot considerable delay occurs before they penetrate to the surface and form visible colonies. The growth was identical in its microscopical and biological characters with South African and Mediterranean varieties. It was clumped by the patient's own serum or by the serum of other Malta fever cases, but as was to be foreseen, it was rather more sensitive to the former than to the latter. The increase of the number of micrococci in his blood, indicated by the possibility of isolating them from such a minute quantity of blood—$\frac{1}{10}$ cc.—and the fall in the agglutination curve gave rise to the suspicion that the fever would pursue a protracted course. The ninth week was marked by a further decline in his agglutinations—400 only. The *M. melitensis* was again recovered. The curve was at this level in the eleventh week. It had sunk to forty in the eighteenth week. Had facilities existed he would have been treated with a vaccine made from his own micrococcus, guided by his phagocytic index. The distance of his residence from London and the absence of grave symptoms induced a continuance of the expectant attitude which was justified by events. Seven months after the onset, when his recovery was complete, his blood still reacted in 100-fold dilution.

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[1] Both tests are now positive.

The illness of this patient, first designated "influenza" by his local medical attendant, suggested to the physician versed in tropical medicine the consideration of Mediterranean and typhoid fevers, liver abscess, kala-azar, malaria. The absence of parasites rendered ague improbable. The normal leucocyte count was against liver abscess. The absence of leucopenia excluded kala-azar. The negative serum reaction to the typhoid bacillus did not, however, render the diagnosis of enteric fever impossible, but the clumping of the *M. melitensis* indicated the true causative factor, which was subsequently demonstrated by the isolation of the coccus from the blood. The story is not yet complete, for we have not told how the infection was conveyed. On his return to the Sudan, he searched for and discovered the goat which had given his milk supply. He took a sample of its blood and labelled it "Blood of a goat whose milk I drank about fifty-four days before I was laid up with Malta fever." This blood, notwithstanding a delay in transit of two months before examination, clumped his micrococcus in a 20-fold dilution, while the blood of a normal goat was without action on it. The goat whose milk he drank was therefore infected. The period of incubation may appear long, but it is not exceptional. In 8 per cent. of attacks, this extends to eight weeks or over (Reports, *Med. Fever Com.*, Part vii., p. 102). A case is recorded in which the onset occurred six months after infection (*Journal of Royal Institute of Public Health*, December, 1907, p. 748). At the same time he despatched the blood of a native who had suffered from fever for ten months on the Blue Nile, and was slowly recovering, though still troubled with joint pains. The native's serum agglutinated the Soudan *M. melitensis* in 160-fold dilution, and in a 40-fold a Mediterranean variety.

It has now been proved that Malta fever prevails in the Sudan, and that the goat is the agent by which the infection is conveyed to man.

## MALTA FEVER IN THE SUDAN.

By Captain L. BOUSFIELD.
*Royal Army Medical Corps.*

Apparently, up to the present, Malta fever has not been described as occurring in the Sudan, though it has been suspected by various observers for some considerable time.

Dr. J. W. Eyre, in the Milroy Lectures of 1908, does not include this country in the geographical distribution of the disease, but since my return to England, Major W. H. Bray, R.A.M.C., informs me he suspected

Malta fever in El Obeid (Kordofan Province) in 1904, and mentioned it in an article published in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, October, 1904. Further, he informs me that at a later date he treated an officer for prolonged fever, and that he had heard subsequently that the *Micrococcus melitensis* had been cultivated from this patient's blood when in Cairo; apparently this case has, unfortunately, never been recorded.

Dr. L. Phillips, of the Kasr-el-tini Hospital, Cairo, reported in 1906[1] that Malta fever was present in Cairo, and also mentioned the case of an officer who was taken ill in the Sudan while on a shooting expedition. Possibly this may be the same case that Major Bray refers to, but it is unfortunate that no note is made as to whether this officer had stayed for any length of time in the Sudan, nor as to the fact of his having served either in Malta or Egypt, for it must be remembered that many are in their time stationed in these places, and might contract the disease there, and thus give the serum reaction for some considerable period afterwards.

When the Dublin Fusiliers had left Malta and were stationed at Alexandria, cases of Malta fever, probably all contracted in Malta, developed for some considerable period after the move.

On arriving, in June, 1907, at Kassala, several cases were handed over to me as suffering from enteric fever, and at that time they had the appearance of that disease, but their subsequent courses and complications were characteristic of Malta fever. From June, 1907, to June, 1908, nineteen cases of fever were seen which clinically resembled Malta fever. Further, there was in the Military Hospital in June, 1907, a Sudan soldier (No. 2,038), who had been in hospital for four and a half months suffering from fever. On examination of his chart, several distinct waves were noted, and as nothing could be found, after careful examination, to account for his pyrexia, some blood was sent for examination. Lieutenant-Colonel Leishman kindly made this examination, and his reply, dated August 19th, 1907, was as follows: "I tested the blood you sent and am able to confirm your suspicions as to the cases being Malta fever; at least if one is able to decide from the agglutination reactions alone. The serum reacted up to $\frac{1}{50}$ complete and was nearly complete in $\frac{1}{100}$. The cultures were not a success, as after two days growths appeared in two tubes, which turned out to be contaminations." Later, two more specimens from other cases were sent, but arrived "putrid" and failed to give any reactions.

When I left Kassala, there was an English officer very ill with fever, whose case was diagnosed as Malta fever; I have recently heard from him, from a nursing home in Cairo, and he informs me that his blood has been tested and gives a positive reaction to the *M. melitensis*. No serum diagnosis was attempted at Kassala owing to there being no laboratory and no cultures. However, after some months, some sterilised emulsions of *M. melitensis* and *Bacillus typhosus* were procured from Allen and Hanbury, but these proved useless, for all the bacteria had disintegrated and there was nothing left except granular *dêbris*—a condition possibly produced by great heat, combined with the shaking of a journey of 250 miles on the back of a camel.

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[1] *Lancet*, February 10th, 1906.

Though these proofs are but weak, the cases clinically resembled Malta fever, lasting in some cases more than four months, showing either continuous fever or waves followed by periods of apyrexia, the spleen being but slightly enlarged, the blood showing no malarial parasites, and the fever being uninfluenced by quinine. Several cases started with severe fever, rapidly passing into a typhoid condition, but subsequently suffering from relapses and complications such as are met with in Malta fever. Further, the water supply was common to all (wells) and no epidemic occurred, which would almost certainly have appeared had the cases been enteric. Most of these severe cases occurred in May and June of both 1907 and 1908, a period which corresponds to the end of the dry season; those occurring in other months were of a milder character.

The goats at this period, as well as the sheep and cattle, are in bad condition owing to the grazing being very scanty and poor, and therefore they are much more likely to feed off garbage. The difference in the condition of herbivorous domestic animals at the beginning and at the end of the rains is very marked, and one wonders at the former period how the animals exist; for it is usual to see goat after goat attempting to feed off the same small patch of closely-cropped dried grass or scrub, and picking up and eating every imaginable form of garbage. Possibly at this season more goats are infected, or those suffering from the disease pass greater numbers of cocci in their urine and milk, owing to their bad condition, which must presumably lessen their resistance.

In Malta, July and August—the hottest months—are stated to be those in which the fever is most prevalent. I do not know whether at this period in Malta the grazing is poor, but from my short stay there I should imagine it to be so; further, I am not aware if it has been ascertained that an infected goat, when in bad condition owing to poor feeding, passes greater and more frequent floods of micrococci in milk and urine than when well fed. It is noticeable that in Kassala there is practically no greater heat during May and June than during several previous months, but it is a very marked fact that during the whole period from the end of one rains to the beginning of the next the grazing gets steadily worse and worse, until towards the end there is almost none. This is put forward as a possible explanation why there are a greater number and more severe cases during these months than the rest of the year.

Of the nineteen cases only one was fatal, and that was due to a complication (cancrum oris), which appeared in a debilitated Arab soldier who had two severe waves of fever.

The complications observed were :—

(*a*) Intense bronchitis, appearing at onset of disease (2).

(*b*) Orchitis, unilateral (2). One passed on to suppuration; gonorrhœa, syphilis, and tubercle were excluded as far as it was possible.

(*c*) Inflammation of the sheaths of the extensor tendons of the wrist (2), and extensors of ankle (1).

(*d*) Cancrum oris. Terminated fatally (1).

(*e*) Intense localised pain over ilium behind, occurring in small areas and persisting for many days, without any physical signs except crippling and very marked tenderness (3).

(*f*) Sciatica (1).

(*g*) Slight and temporary enlargement, pain and tenderness in glands of anterior triangles of neck, unaccompanied by throat symptoms (2).

(*h*) Albuminuria, persistent for several weeks, the patient showing no signs of chronic renal disease (1).

(*i*) Severe diarrhœa, not of a "pea-soup" character, and appearing in those with acute and severe onsets (3).

Some cases had several of these complications, one having at different periods orchitis, synovitis, and localised pain over the ilium. Several cases had no complications; two cases, lasting over four months in each case, practically suffered only from fever. Profuse sweating was noted in many cases, especially in those of the severe type.

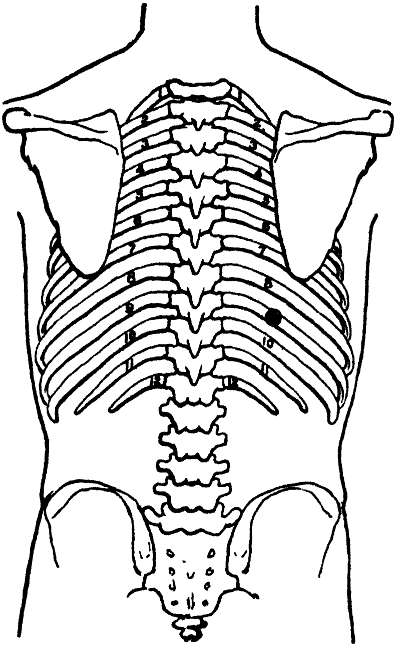
Thus the Sudan I think, without doubt, should be added to the geographical distribution of Malta fever.

## ABSCESS OF THE LUNG SECONDARY TO ABSCESS OF THE LIVER.

By Major F. J. MORGAN.
*Royal Army Medical Corps.*

A large proportion of cases of abscess of the liver, in which expectoration of the abscess contents is going on, do badly and go from bad to worse, unless the abscess can be drained by operation; but to locate such an abscess by exploration with trocar and cannula is, in my experience, often a matter of difficulty, deeply situated as such a cavity often is in the centre of the upper dome-like part of the right lobe, and small as it may be, on account of continual partial evacuation of its contents.

*Post-mortem* examination of a certain number of these cases led me to observe that the abscess track in the lung always occupied its posterior half; that in a large proportion it was only separated from the pleural surface behind by an inch or less of consolidated lung tissue; and, in advanced cases, that the posterior part of the lung in its lower third or so was quite broken down, forming an abscess cavity bounded behind by thickened pleura only. It occurred to me that the difficulty of locating and draining these abscesses, *viâ* the liver, from the front or side might be overcome by drainage from the back, which would offer the additional advantage of drainage at the lowest point of the abscess track in the recumbent position necessarily occupied by these critically ill patients. I accordingly adopted this procedure in the next few cases, and with very satisfactory results. I found that I could usually locate the abscess track at the first puncture, having done so in five cases of the eight under review; and some reasons for not having done so in all will be given in the particulars of the cases to follow. That this method is one that meets the requirements of the condition will be shown by the progress of the cases after operation. Most of the patients were going down-hill rapidly, being emaciated and feeble, and without rest at night, on account of the necessity of continual expectoration; but from the time of operation their progress to recovery was rapid and uninterrupted, and generally as follows: Cessation of expectoration of pus occurred in twenty-four hours; cessation of fever and cough in a few days; and the patient became comparatively strong and well in two months.



Site of exploratory puncture and subsequent operation.

The procedure is as follows: A spot is selected for exploratory puncture about 1 inch below the angle of the right scapula, and 3 inches from the middle line of the back. Here a medium-sized trocar and cannula is inserted for a couple of inches or so. On liver pus being located, 2 inches of rib is excised, as usual. I have always found the pleural surfaces united by adhesions. A bistoury is passed along the cannula, and the tissues divided sufficiently for the passage of a finger into the abscess cavity, the opening being subsequently enlarged by cutting or tearing to an extent sufficient to provide a free opening into the abscess track. A pint or more of pus usually escapes. A drainage-tube of about ¾ inch diameter is used. The tissues incised usually consist of thickened pleura and disorganised lung tissue, but on some occasions an inch or so of consolidated lung has had to be divided. On one occasion only was smart hæmorrhage incurred, and this was readily controlled by gauze packing around the drainage-tube.

The following are brief notes of the cases; all were invalids from India.

(1) Private R. History of profuse expectoration and signs of liver abscess for three months. At time of arrival expectorating about ½ pint of liver abscess pus daily; liver enlarged upwards; base of right lung dull on percussion.

*Operation.*—Exploration of liver negative; pus located at base of right lung behind, at third attempt in this situation. A piece of the ninth rib excised, the abscess track freely opened and drained with a large tube. Expectoration of pus soon ceased, he made an uninterrupted recovery, and was well, with the wound healed, in three months.

(2) Private D. Had been expectorating pus for nine months. On arrival usual signs of liver abscess, profuse expectoration, irregular fever, base of right lung dull, absence of vocal fremitus, little air entry. Exploration of liver in several places, negative; pus located at first puncture below angle of scapula. Operation as before. About a pint of pus escaped. Fever and expectoration soon ceased; recovery was uninterrupted, and he was healed and well in two months.

(3) Gunner P. Liver abscess operation three months before arrival at Netley, when he had a discharging sinus. The sinus was twice opened up and scraped out, and later a counter-opening was made, but he remained ill and had irregular fever. Liver several times explored with negative result. Four months after arrival at Netley he began to expectorate liver abscess pus. Exploration below the angle of the scapula located pus at the first attempt, and a cavity was opened and drained as before. Cough and expectoration of pus soon ceased, but no general improvement occurred, and he died. At the *post-mortem* examination the right lobe of the liver was found to contain numerous abscesses, one of which communicated with a large ragged cavity in the base of the right lung, which was well drained by the last operation. The large intestine throughout presented circumscribed patches of submucous infiltration, and was ulcerated superficially.

(4) Bombadier M. Invalided as a case of tubercle of the lung. History of five months' profuse expectoration: thin and weak; frequent cough;

expectorating a quantity of what appeared to be liver abscess pus, and in which tubercle bacilli were not found. Liver enlarged upwards in front; base of right lung dull behind. Exploration below the angle of the scapula located pus at the first puncture, and a large abscess was evacuated and drained. Fever, cough, and expectoration of pus ceased in a few days, and his recovery was uninterrupted. A narrow sinus persisted for some months at site of the operation wound, but it eventually healed, and he left hospital strong and well.

(5) Gunner McC. Operation for liver abscess abroad; operation wound healed, but he was expectorating much liver abscess pus. Exploration below angle of scapula located pus at first puncture, and a large collection of pus was evacuated. Hæmorrhage required packing the cavity with gauze around the drainage-tube for a few days. Uninterrupted recovery; healed and quite well in two months.

(6) Driver A. Very emaciated and weak; severe dysentery going on; signs of liver abscess. October 29th, 1907: right lobe of liver explored; pus found, and a large abscess evacuated and drained. He very slowly and steadily recovered from an almost hopeless condition, and the dysentery yielded to ipecacuanha. In two months he was healed and convalescent. He then became less well; fever returned; he began to cough, and shortly after to expectorate liver abscess pus. December 30th, 1907: explored below angle of scapula; pus located at first puncture, and an abscess cavity in the base of the right lung evacuated and drained. Expectoration of pus ceased at once, and cough in a few days. He became quite well by February 25th, 1908.

(7) Bombardier F. History of signs of liver abscess and profuse expectoration in October, 1907. Operation was commenced, but not completed abroad on account of his critical condition under anæsthesia. January 10th, 1908: doing well for some time, up and about, and only expectorating pus at intervals. February 17th, 1908: not so well; fever; more purulent expectoration; base of right lung showed signs of consolidation. Exploration below angle of scapula, and in two other places near by, was negative; exploration through his old operation scar in the mid-axillary line located pus, and a large liver abscess was evacuated and drained in this situation. His recovery was rapid and steady, expectoration ceasing in a few days; he was quite well by March 14th, 1908.

This patient was little in bed during his illness, and I think it may be partly on this account—the absence of gravitation backwards—that the abscess track in the lung was not found by exploration from the back.

(8) Private R. History of signs of liver abscess in October, 1907, when the liver was explored abroad, with negative result. Began to expectorate in November, 1907, and has done so since, the quantity now (February 28th, 1908) being large. Thin and feeble; liver moderately enlarged; signs of consolidation at right lung base. March 4th, 1908: exploration below angle of scapula, negative; again 6 inches from middle

line of back, on the same level, located pus; an incision through thickened pleura and consolidated lung tissue entered the abscess track. Expectoration of liver abscess pus ceased in a few days; his recovery was uninterrupted, and he was convalescent in a month's time. A nearly dry sinus persisted for some time, but eventually healed, and he left hospital in the best of health.

## A METHOD OF FINDING AND SEPARATING OUT THE SAC OF AN INGUINAL HERNIA.

By Captain J. E. CHURTON.
*Royal Army Medical Corps.*

Having experienced difficulties in dissecting out the sac of an inguinal hernia, and having seen the same arise at the hands of others—probably owing to the somewhat ambiguous phraseology of the majority of books in dealing with this step of the operation—I am tempted to give a short account of a method which, to my mind, materially simplifies that which otherwise appears to be rather intricate.

(1) *Exposure of the Inguinal Canal.*—The inguinal canal is exposed by an incision through the skin, superficial structures, and the external oblique; the under surface of the lower portion of the latter is then freed to expose Poupart's ligament, and retracted in order to give a good view of the cord lying in the inguinal canal. (I have purposely omitted detail of this first step, as text-book descriptions of it are excellent.)

(2) *Exposure of the Sac.*—With a sharp scalpel divide, in the direction of and along the centre of the cord, the cremasteric fascia and muscle; then, holding aside this divided structure, the sac will become exposed to view, which, if empty, is easily identified by its being of a milky-white colour. If not empty—in the case of a reducible hernia—it is easily emptied and kept so by raising the patient up into the Trendelenburg posture. In the case of a bubonocele, that part of the internal oblique muscle which forms part of the front wall of the inguinal canal had better be retracted upwards and outwards, as in these cases the sac often does not reach beyond the lower border of this muscle.

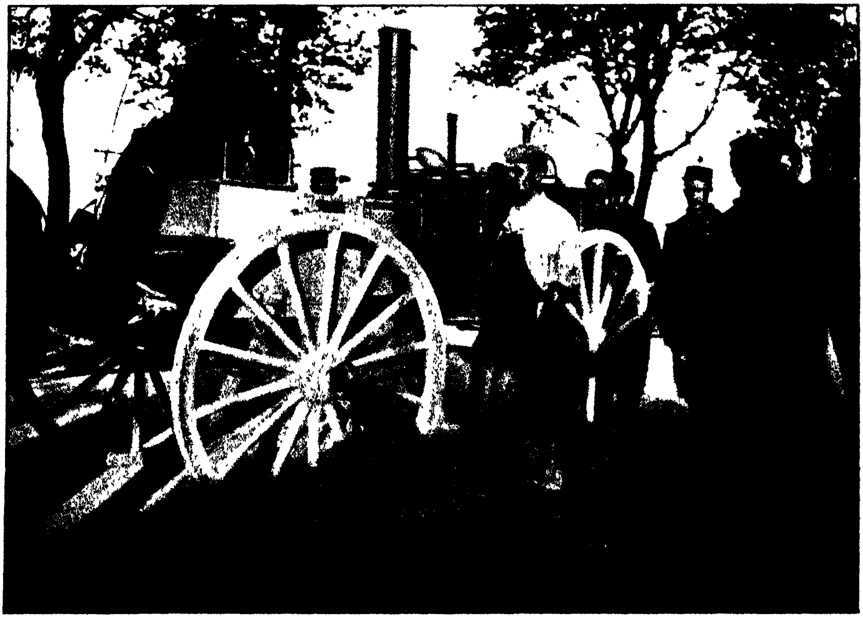
(3) *Separation of the Sac.*—With dissecting forceps carefully pick up the upper wall of the sac, raise this, and at the same time, with some form of a blunt-pointed dissector (personally, I use the end of a pair of dissecting forceps with the blades held together), retract off from either side, in a perpendicular direction, the structures of the cord, until the lower edge of the sac is reached; now, with a finger passed completely round the detached portion of the sac, the remaining separation becomes a matter of simplicity.

# MOBILE FIELD KITCHENS.

By Lieutenant-Colonel R. PORTER.
*Royal Army Medical Corps.*

The question of employing mobile field kitchens is one that is now being considered by various European armies. In the manœuvres that took place this year in France and Germany, various types of these kitchens were employed.

So far as the French manœuvres were concerned, these kitchens, called *cuisines roulantes*, gave satisfactory results, and the accounts which I have read in various French papers go to show that these travelling kitchens were found most useful, and the opinions expressed by different military officers were highly eulogistic of their general utility on manœuvres. Every commanding officer recognises the importance of feeding his men regularly and with the least possible amount of exertion, thus reserving their energies for more serious duties. The mobile field kitchens would seem to attain these objects.



Before changing any system in the army, particularly the one that has for its object the preparation and serving of the soldiers' food, it must be clearly proved that the new method is better than the old, is practicable under all conditions of service, and the expense is not prohibitive. What may suit an army in Western Europe, where the roads are good,

may not suit an army operating in Africa, and the practical test of manœuvres is the only means we have of deciding questions of this sort. My object, therefore, in writing this short paper, is to suggest that some types of mobile field kitchens be tried in our army next year, during manœuvres. The Russians used these kitchens in Manchuria with success, and often with great comfort and saving of labour to their men.

According to the French papers, the general consensus of opinion amongst French officers was very much in favour of this method of cooking the soldiers' rations, and one of the military correspondents, I think General Pedoyra, was loud in his praises of *les cuisines roulantes.* In a description given in *Le Matin* by one of the correspondents, of an action between the two army corps engaged in the manœuvres, the men belonging to the one possessing *les cuisines roulantes* had their dinners practically as soon as the "cease fire" sounded, which took place at 2 p.m., whilst the men belonging to the other *corps d'armée* were still seen gathering wood and trying to cook their food at 7 p.m. Testimony such as this is very valuable, and we shall probably have a report from our military *attaché*, who attended the manœuvres, on this subject. In the meantime, however, this matter should be given due attention, so that during our manœuvres next year our troops may be given the opportunity of testing the practicability of these mobile field kitchens.

In the French manœuvres two types were used—one a two-wheeled cart fitted with shafts, having a swingletree for a second horse; the second pattern was a four-wheeled limbered vehicle. These carts were fitted with a furnace, and were divided into two parts—one for soup and one for coffee, the larger cauldron having a capacity of about 170 litres, and the smaller about 80 litres. Rations were carried in a box on which the driver sat, and both these types were drawn by a pair of horses. The accompanying photographs were taken at the French manœuvres, and I have to thank the editor of *Le Matin* for sending me a few copies.

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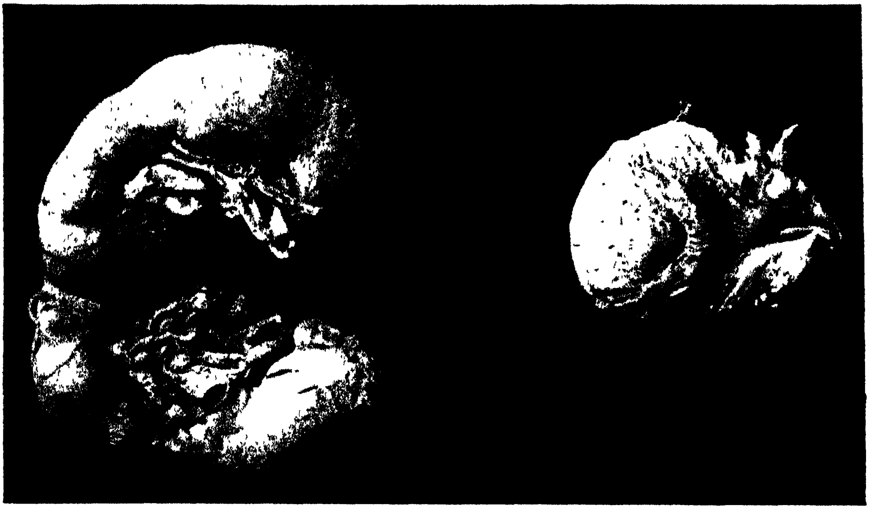
## HORSE-SHOE SHAPED KIDNEY IN PLACE OF TWO KIDNEYS.

By Lieutenant-Colonel G. F. POYNDER.
*Royal Army Medical Corps (R.).*

THE following case may be of interest as presenting two abnormalities not often met with on the *post-mortem* table:—

Serjeant G. A. W. (aged 27, service fourteen years) was admitted with well-marked chronic Bright's disease on June 22nd, 1908. The urine, on admission, was highly albuminous, and never improved, though the treatment was frequently changed in consultation with other medical men, and death occurred on the morning of July 22nd, 1908. *Post mortem:* Rigor mortis was well marked, and the body very anæmic; a large amount of fluid was found in the thorax and abdomen, also in the pericardium; there were no adhesions. The heart was much enlarged, weight 1 lb. ½ oz.; the valves were healthy. The left lung weighed 1 lb. 7 oz.; the lower half of the left lobe was congested; portions floated in water. The right lung weighed 1 lb. 3 oz. and was normal, except that it consisted of only two lobes. The liver weighed 4 lb. 3 oz., and showed nutmeg changes. The spleen, weight 7½ oz., was friable in consistence.



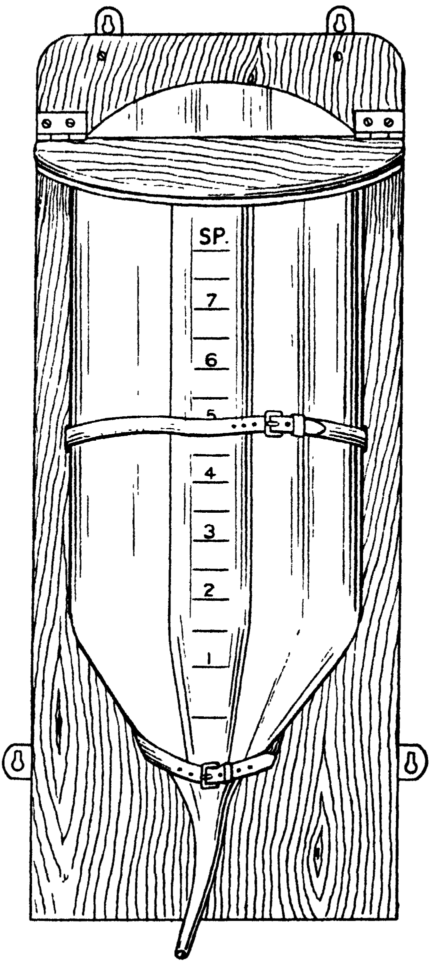
Two kidneys in *one* horseshoe kidney. Kidney structure throughout. Two small bits of wood inserted into bladder openings of ureter. Removed *post mortem* from Serjeant W., A.P.D., Bedford Military Hospital. Originals sent to Pathological Museum, Millbank.

On looking for kidneys it was found that they were not in their normal position, but after some difficulty they were found as *one organ of a horse-shoe shape* in front of spine (*vide* photograph). *The bladder was normal.* Two small pieces of wood have been inserted in the two openings of the ureters in the floor of bladder in the usual position (*vide* photograph). The pancreas was pale yellow in colour, and weighed 2¼ oz.

## BRACKET FOR IRRIGATOR.

By Lieutenant-Colonel BRAZIER CREAGH, C.M.G.
*Royal Army Medical Corps.*

Seeing in the July number of the Journal the admirable device of Lieutenant-Colonel J. A. B. Daly, C.B., for preventing damage to irrigators, I send you a sketch of a similar bracket which I have designed, and use in this hospital. It has the additional advantage of four supports, as I found one nail was insufficient for so weighty an article, requiring to be constantly removed. It is provided with a lid to protect the solution and interior of the receptacle from dust and contamination.



# Reports.

## REPORT ON THE SURGERY DONE IN THE STATION HOSPITAL, RAWALPINDI, FROM MARCH, 1906, TO MARCH, 1908.

By Captain C. H. TURNER.
*Royal Army Medical Corps.*

THE period above mentioned is taken because it represents twelve months' actual work. Owing to the unfavourable climatic conditions, only emergency operations were performed in Pindi between May 1st and November 1st. Anæsthetics were administered on 400 occasions, and the following are the chief operations which were performed:—

| | |
|---|---|
| I. Operations on the Abdominal Organs. | |
| (*a*) Radical cure of hernia | 14 |
| (*b*) Laparotomy | 13 |
| For appendicectomy | 4 |
| ,, appendix abscess | 3 |
| ,, acute intestinal obstruction | 2 |
| ,, perforation of typhoid ulcer | 1 |
| ,, liver abscess | 2 |
| ,, gall-stones | 1 |
| (*c*) Excision of rib and drainage of liver abscess | 11 |
| (*d*) Exploration of liver by puncture | 8 |
| (*e*) Nephrotomy for ruptured kidney | 1 |
| II. Operations on the Skull. | |
| (*a*) Trephining | 4 |
| For depressed fracture | 1 |
| ,, temporo-sphenoidal abscess | 1 |
| ,, frontal sinusitis | 1 |
| ,, cerebellar tumour | 1 |
| (*b*) Complete mastoid operation for middle-ear disease | 2 |
| (c) Exploratory operation for fractured skull | 1 |
| III. Operations on Throat and Nose. | |
| Tracheotomy | 1 |
| Drainage of ethmoidal sinuses | 2 |
| Radical operation for chronic empyema of antrum of Highmore | 1 |
| IV. Operations on Bones and Joints. | |
| Wiring ununited fractures | 2 |
| Sequestrotomy | 3 |
| Interscapular thoracic amputation | 1 |
| Excision of loose cartilage | 5 |
| Exploration of knee-joint for bullet | 1 |
| V. Operations on Venous System. | |
| Ligature and excision of varicose veins | 13 |
| Radical operation for varicocele | 3 |
| Hæmorrhoids | 17 |

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|---|---|
| VI. Operations on Testicle, Bladder, and Urethra. | |
| Castration | 6 |
| Extravasation of urine | 1 |
| Urethral fistula | 2 |
| VII. Operations on Nerves. | |
| Stretching great sciatic | 1 |
| Exposure of peroneal | 1 |
| Exposure of median | 1 |

### REMARKS ON THE OPERATIONS.

*Radical Cure of Hernia.*—In all cases a modified Bassini's radical operation was done.

*Of the fourteen cases,* one was recurrent; two were double, acquired; six were single, acquired; five were congenital. In one of the congenital variety the appendix was found in and adherent to the sac; it was removed in the usual manner. There was no special feature with regard to the other cases. Suppuration occurred in one case; the rest healed by first intention.

*Laparotomy for Appendicectomy and Appendix Abscess.*—In four cases the appendix was removed; two were in the acute stage, in one the appendix showed commencing gangrene of the tip, and in the other the appendix was in a state of general acute inflammation. The remaining two were cases of recurrent appendicitis. In one no less than eight severe attacks had occurred, and the operation accordingly presented some difficulty; the appendix was lying in a mass of inflamed omentum and dipped over the edge of the pelvis, adhering to the external iliac vein. The second case was one in which the patient had suffered from dyspeptic symptoms and pain in the iliac fossa for some years; removal of appendix relieved the symptoms. The three cases of abscess were drained, and the appendix was not removed; one had suffered from a previous attack. All made uninterrupted recoveries.

*Acute Intestinal Obstruction due to Gangrene and Empyema of Meckel's Diverticulum.*—Briefly, this case presented all the signs and symptoms of an acute appendicitis. At first incision over appendix region the cæcum was found dragged up towards the middle line and adherent to the anterior abdominal wall just below and to right of umbilicus; the incision was closed. A second incision was then made just to right of the middle line, and what was apparently an abscess cavity containing about 4 ounces of pus was opened; on further examination this was found to be a dilated and grangrenous Meckel's diverticulum adherent to the anterior abdominal wall; this was removed and the wound drained. The patient made an excellent recovery. This case was reported in the *Lancet* (January 4th, 1908).

*Acute Intestinal Obstruction due to Strangulation of the First Part of the Jejunum in one of the Duodeno-jejunal Fossæ.*—This occurred in a man who was at the time in hospital convalescing from a fractured femur.

The symptoms were sudden acute pain in the left flank and vomiting. He was seen almost at once. There was tenderness on deep pressure to inner side of left kidney. The pulse-rate was 70, but did not increase during the first twenty hours. There was slight retching and hiccough, and pain persisted; no flatus passed *per rectum.* There had been no action of bowels since onset of symptoms, but just previously they had acted twice. The abdomen was flat and moving well; there was no rigidity. Later, however, the pulse began to increase in rate, and in two hours had increased to 100. Operation was performed within twenty-four hours of onset of symptoms. The first part of the jejunum was found distended for about 2 feet, and here it was found caught, but was released quite easily; below the place where it had been nipped the bowel was collapsed. The patient made an uninterrupted recovery. The interesting feature of the case was the early stage at which operation was performed, the case coming under observation at the immediate onset of the trouble, enabling one to make an early diagnosis.

*Perforated Typhoid Ulcer and General Peritonitis.*—This patient, in the third week of his illness, developed the symptoms of perforation, from which he, however, recovered. About two weeks later, when he was apparently convalescent, he developed symptoms of sub-acute appendicitis with a well-marked tumour in the right iliac fossa; about a week later he again had an attack similar to the one he had in the third week. Laparotomy was done about forty-eight hours after the onset, and general peritonitis was present, pockets of semi-purulent fluid being found among coils of adherent intestine all over the abdomen; these were emptied and sponged out, the patient's condition not admitting of any further procedure. He died a few hours later; *post-mortem* a gangrenous ulcerated appendix, with a perforation at the junction of the appendix to the cæcum, was found. There was considerable matting of the omentum and intestine in the right iliac fossa, and pus was found here and in the pelvis. Almost completely-healed typhoid ulcers were found in the small intestine. I think the explanation of the case was that a perforation of a typhoid ulcer, situated in the cæcum close to the appendix opening, actually did occur in the first place (during the third week); this was shut off by adhesions and an abscess developed, which was to all intents and purposes an appendix abscess; this ruptured secondarily into the general peritoneal cavity.

*Liver Abscess.*—One liver abscess was drained through the abdominal wall; the abscess was a small acute one, situated at the extreme lower margin of the right lobe, containing about 2 ounces of pus. Exploratory puncture had failed to find it, and as the symptoms pointed rather to a subhepatic condition exploratory laparotomy was performed.

A second case was in a man who was transferred from one of the section hospitals with a history of pain and tenderness in the right iliac fossa. On admission to the station hospital, the chief symptoms pointed to the liver, which was enlarged in an upward direction; there was no tenderness on deep palpation in the right iliac fossa, but there seemed to be some thickening and resistance in that region. The case was regarded as a primary appendicitis and secondary, either subphrenic or intra-hepatic, suppuration. As the liver symptoms appeared the more urgent, it was decided to explore the liver first. *First Operation.*—Exploratory puncture revealed a small abscess in the upper part of the right lobe, which was drained by excising a rib. The temperature, however, kept up, and there was tenderness over the margin of the right lower lobe. A marked leucocytosis was present. *Second Operation.*—An exploratory incision was made through the right linea semilunaris and the liver examined. The upper surface of the right lobe was healthy, but on the under surface, high up, just to the right of the portal fissure, a small area of liver substance, about the size of a five-shilling piece, felt rough and hard; in the left lobe there were also two similar areas. From this it appeared evident that one was dealing with a pyæmic condition of the liver; the patient, however, was taking the anæsthetic very badly, so that nothing further was done. The after history of the case is interesting. The symptoms subsided, the temperature coming down to normal slowly, the pain disappeared and the liver gradually became normal in size. Two months later he was discharged quite fit, having put on 1½ stone in weight, only to be admitted within six weeks with an acute sub-cæcal abscess obviously in connection with his appendix, which was drained and from which he made an uneventful recovery.

*Cholelithiasis and Suppurative Cholecystitis.*—The patient, the wife of an N.C.O., had suffered from recurrent attacks of biliary colic for two years. When she was admitted to hospital she had just got over a severe attack and was slightly jaundiced. She had a temperature between 101-103°F., and there was a marked tenderness and resistance in the right hypochondrium. A tumour could be felt extending a hand's-breadth below the right costal margin, dull to percussion and directly continuous with the liver dulness. *Operation.*—An incision immediately over the tumour, beginning at the tip of the ninth costal cartilage, exposed an enlarged gall-bladder, with walls ½ inch thick; this was sutured to the parietal peritoneum and opened; it contained pus. Two large stones, one about ½ inch in diameter, were removed from the cystic duct. The gall-bladder was drained. Patient made a good recovery from the operation, but at the time of writing the wound has opened and there is a biliary fistula; it is proposed to do an operation to close it.

*Liver Abscess.*—Eleven cases were treated by excision of a portion of the rib and drainage, with two deaths. In both the fatal cases multiple abscesses were found *post mortem.* Of the remaining nine cases, one had been operated on for liver abscess two years previously. The remainder presented no special features of interest, but in only four cases was an undoubted history of dysentery obtained.

There is one point to which I would draw attention in the after treatment of liver abscess. In three of these cases, after drainage of the abscess, the improvement one naturally looks for did not take place, but on the contrary the temperature kept up, the wound looked unhealthy and showed no inclination to heal, though the discharge had ceased and the tubes had been shortened or removed; the patients appeared in fact to be going down hill, and all this in the absence of any signs of symptoms pointing to a further collection of pus. Arguing partly from the successful results that have attended the treatment of some cases of liver abscess by aspiration and injection with solution of quinine, and partly from observation of the tendency of wounds (operation or otherwise) to become chronic in persons who have suffered from malaria (examination of the blood of all these patients was negative, though in one of the cases the medical history sheet showed an admission for malaria), I gave them intramuscular injections of bi-hydrochloride of quinine, gr. 20, on four successive days. It is no exaggeration to say that in all three cases it acted like magic, the temperature coming down to normal and remaining down after the first or second injection, the wound assuming a healthy appearance and rapidly healing, and the patients' general condition and appearance undergoing a very marked change. As a rule I gave them further injections, twice a week on successive days, for three more weeks. My own opinion of the cause and effect is that they are due to a latent malaria.

*Hepatitis.*—Eight cases were explored for liver abscess without finding pus; these cases all cleared up.

*Nephrotomy for Ruptured Kidney.*—The patient was admitted somewhat collapsed; he was doing a long-arm balance on the parallel bars when he slipped and fell over one side of the bar, which caught him in the left loin. On admission at 1.30 p.m. his temperature was 97·6°, and pulse 52. He complained of pain referred to the lower ribs on the left side, but recovered from the collapse and seemed more free from pain after being put to bed. At 3 p.m. he began to cry out with pain in the left loin, radiating to the front of abdomen; his temperature was 98° and pulse 82, and the urine passed contained blood. The left flank appeared fuller than the right, and there was an elastic feeling on palpation, the percussion note being dull in the flank and flat all down the left side of abdomen. There was no dulness in the left iliac fossa, and pain was referred upwards towards the diaphragm; he had slight hiccough, and the pulse increased during the next hour to 112. I decided to operate, as the diagnosis of extensive rupture of the kidney with continued hæmorrhage was evident. *Operation.*—An incision was made parallel to last rib; the perirenal tissue was found full of blood and clot; the kidney exposed after washing the blood away showed a horizontal tear across the posterior surface of the lower pole, extending within a quarter of an inch of the concave border to the convex border, involving this and the anterior surface for about a quarter of an inch. There was another slight tear on the anterior surface, just through the capsule. The main tear was about three-sixteenth of an inch deep. The tear in the kidney was packed, and about a dozen long strips of gauze were packed all round the kidney till it was quite tight. Intravenous transfusion was carried out during the operation. The usual methods were adopted later to combat collapse. The plugs were removed under chloroform forty-eight hours later; there was no hæmorrhage. The patient made an uneventful recovery and is now doing his duty. Seen one year later, he was in perfect health and had no trouble with the wound.

*Trephining Depressed Fracture.*—A case of double depressed fracture caused by blows from a loaded stick. One fracture involved both anterior and posterior walls of the right frontal sinus, some small portions of the posterior wall being driven into the frontal lobe. The opening was enlarged and pieces were removed. The other was a depressed fracture over the right motor area. A skin-flap was turned back and a half-inch trephine hole made at one margin of the depressed fragment; the inner table was found extensively fractured, and a large loose fragment was removed. The patient recovered completely, and did not develop any unfavourable symptoms.

*Temporo-sphenoidal Abscess.*—This case was a transfer from an out-station with a history of symptoms pointing to temporo-sphenoidal abscess. He was unconscious on admission, and was trephined over the temporo-sphenoidal region; no abscess was found, but septic meningitis was present. He died six hours later, and extensive septic meningitis was found, the whole of the convex surface of brain being covered with lymph; streptococci in pure culture were present. The meningitis was secondary to middle-ear disease.

*Cerebellar Tumour.*—The patient had been ill for two months, having all the symptoms of a tumour involving the right lobe of the cerebellum and extending into the pons. Intense double optic neuritis was present, and he had not improved under anti-specific treatment, though this had been vigorously carried out. He was trephined to drain the subdural space just below and to the right of the sub-occipital protuberance, with the idea of relieving the optic neuritis and preserving his sight, and at the same time exploring the cerebellum for a removable tumour. The patient did not survive the operation many days. No tumour was found, but there was a great gush of cerebrospinal fluid on opening the dura mater, and strands of catgut were left *in situ* to drain the space. *Post-mortem.*—There was marked pachy-meningitis of chronic nature, evidently syphilitic. No tumour was present.

*Frontal Sinusitis.*—This occurred in a man who, during the past five years, had several operations performed for suppuration in the accessory sinuses of the nose. He eventually died from thrombosis of the cavernous sinus and meningitis.

*Chronic Middle-ear Disease.*—Two cases were submitted to the complete mastoid operation, in one of which the whole of the mastoid cells were involved from the antrum to the apex; necrosis had taken place into the digastric fossæ, with formation of a small abscess in the neck. Both cases were invalided, the one described above being very much improved; the tympanum was not interfered with in this case.

*Exploratory Incision for Fractured Skull.*—This was done for a man who, after a fall on the head, had persistent localised headache and tenderness, subnormal temperature, and a slow pulse. No fracture was found, but the symptoms cleared up.

*Operations on Throat and Nose.*—Tracheotomy was performed once for cut throat involving the larynx.

Draining of ethmoid sinuses for chronic suppurative disease was done in two cases; considerable improvement followed in one case, but very little improvement occurred in the second one. The patients were invalided. One operation was done for chronic empyema of the antrum; this was successful, but the patient later developed frontal sinusitis and eventually died.

*Wiring Ununited Fractures.*—Two cases were operated upon, both of which did well, the bones uniting firmly after operation.

*Sequestrotomy.*—Three cases, one of the ulna and two of the tibia, after injuries.

*Loose Cartilage.*—Five cases were operated upon, four for loose internal and one for loose external semilunar cartilages. All did well, and returned to duty within a month or six weeks.

*Exploration of Knee-joint for Bullet.*—A revolver wound involving the joint. A bullet was found amidst the fragments of bone and tissue *débris* at the outer aspect of the joint. The wound and joint were irrigated and drained for twenty-four hours, and healed by first intention. The patient was recovering the use of the joint when invalided home.

*Interscapular Thoracic Amputation.*—The patient, a man, aged 26, was transferred from an out-station to Rawalpindi for operation. The history of the case was: Four months previously he had been in hospital with pain in the left shoulder, which had improved after fourteen days' treatment. On April 18, 1907, he was again admitted for the same thing. The pain was dull in character, with very acute exacerbations, and radiated down the arm. The shoulder-joint was quite free in its movements, but the scapula was prominent, projecting very much at its inferior angle. There was prominence in front of the clavicle on that side, and pain and tenderness over the clavicle and scapula. He could not raise the hand to the head. The left pulse was diminished in volume in comparison with the right. The pain became very much worse, in fact at times was agonising, and the signs increased. A rapidly-growing tumour (probably sarcoma), springing from the under surface of the scapula, pressing on the brachial plexus and subclavian artery, was diagnosed. A fore-quarter amputation was done, the inner third of the clavicle being left, the subclavian vessel being secured first. The growth, about the size of two clenched fists, was springing from the under surface of the scapula, involving the brachial plexus and displacing the large vessels. The patient made an uninterrupted recovery, and I heard four months later that he was in perfect health and increasing in weight. The growth was found to be a round-celled sarcoma.

*Operations on Venous System. Varicose Veins.*—Thirteen cases were operated on for this condition; in five cases both legs were affected. In all cases ligature of the internal saphenus in two places at the saphenus opening and excision of the intervening portion, and at the same time ligature of the posterior femoral branch where it joins the saphenus vein, were done. As a rule any prominent branches of veins below the knee were also dissected out, and if the radicles of the external saphenus vein were also varicose this vein was treated in the same way as the internal, just at the point where it pierces the deep fascia to join the popliteal vein. The results were satisfactory; no cases have so far been admitted with recurrence.

*Varicocele.*—Only three cases have been operated upon for this condition, which is rather curious, as one is led to believe that any slight tendency to this condition is aggravated by residence in a hot climate. The high operation was performed in all.

*Hæmorrhoids.*—Seventeen cases of internal hæmorrhoids were operated upon. In one case Whitehead's operation was done; the patient, an elderly man, had been operated on twice previously. The result was good. He was seen a year after, when he stated that no further trouble had occurred; on examination there was no suggestion of anal stricture. The other cases were either treated by ligature and excision, or by clamping excision and continuous suture (Mitcheli's method).

*Operations on Testicles.*—Unilateral castration was done on six occasions, three times for tubercular disease, twice for syphilitic disease with hernia of testis, and once for traumatic orchitis with abscess in the testicle. All did well. Two of the tubercular cases seen from time to time were in perfect health.

*Extravasation of Urine.*—This occurred in a man, aged 35, who was in hospital with malaria. He made a good recovery, and a full-sized bougie could be passed easily before discharge from hospital.

*Urethral Fistula.*—Two cases came under observation; both were secondary to lacunar abscess behind stricture, and were treated by excision of fistulous tract, dilatation of stricture and tying in a silver catheter for a few days, and periodic dilatation by bougies later. Both were cured.

### *Operations on Nerves.*

*Great Sciatic.*—This was stretched by open method for chronic sciatica of some years' standing; temporary relief resulted.

*Peroneal.*—This was exposed and freed from cicatricial tissue; some slight improvement in the foot drop was taking place when he was invalided home.

*Median Nerve.*—This was exposed for partial paralysis following an impacted Colles fracture which had not been disimpacted. The nerve was involved in fibrous tissue at its outer side; it was freed and the scar tissue removed. I had not the opportunity of seeing the progress of the case.

I am much indebted to Captains Davidson and Kelly, R.A.M.C., for permission to publish some of their cases, which are included in the above, viz., the Interscapular Thoracic Amputation and some of the Liver Abscess cases.

## REPORT ON A FURTHER SERIES OF BLOOD CULTURES FROM SEVENTY-FOUR CASES OF TYPHOID AND PARATYPHOID FEVER.[1]

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In the September number of last year's Corps Journal, I published a series of fifty-five cases of typhoid and paratyphoid fever in which blood-culture methods had been employed. In eighteen of these cases, the broth method of culture was employed, whilst in the other thirty-seven cases, the patients' blood—drawn with antiseptic precautions from a finger—was placed in sterile ox-bile (Kayser and Conradi's method). The superiority of the bile method of culture (50 per cent. of successes as against 20 per cent. by using broth) led to the speedy abandonment of the broth method; and in the series of seventy-four cases enumerated below, Kayser's bile method of culture has alone been employed.

*The Method Employed.*—This was fully described in the article which appeared in last September's number of the Corps' Journal, but may be briefly restated. The patient's finger is sterilised by the application of a wet dressing (1-20 carbolic, or preferably 1-500 perchloride of mercury) an hour or two before the culture is to be taken. The pulp of the finger is pricked with a broad-bladed needle, the blood collected in a sterile pipette, and transferred to a small test-tube containing sterile ox-bile. By the intermittent application of a tourniquet to the patient's finger, and if necessary a second prick or two, it is comparatively easy to obtain 1 cc. or more of blood from a finger. The admixture of blood and bile in the test-tube is incubated for sixteen hours, and a drop of the incubated mixture smeared with a glass spreader over an agar plate. After a further sixteen hours' incubation the plates are ready to examine.

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[1] The diagnosis of typhoid and paratyphoid fever was made by means of cultures taken from the blood in these diseases.

Table I.—Giving a List of the Cases of Typhoid Fever from which Cultures were made. The Dates on which these Patients were Admitted to Hospital, and on which Cultures were taken from their Blood, the Number of Days of Fever supervening after Admission to Hospital and after Blood Culture are given in Each Case. The 8th Column of the Table shows the Results Obtained by Blood Culture, while Columns 7 and 9 are Devoted to Remarks as to the Severity of the Case and the Probable Period at which the Culture was taken.

| No. | Name | Date of admission | Date of blood culture | Number of days fever after admission | Number of days fever after blood culture | Nature of case | Result of culture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | Turnstall .. | 20.10.07 | 21.10.07 | 7 | 6 | Very mild .. | Positive | — |
| 2 | Jeffries .. .. | 6.10.07 | 27.10.07 | 31 | 9 | Severe .. .. | Negative | Culture taken very late in disease. |
| 3 | Kirby .. .. | 23.10.07 | 23.10.07 | 3 | 3 | Very mild .. | Positive | 4 cc. of blood taken for culture, as patient inoculated. |
| 4 | McKinnon .. | 2.11.07 | 3.11.07 | 8 | 7 | ,, .. | Negative | — |
| 5 | Hollingsworth .. | 11.11.07 | 13.11.07 | 7 | 5 | ,, .. | ,, | Patient inoculated, 1906. |
| 6 | Dixon .. .. | 8.11.07 | 14.11.07 | 17 + 3 relapses | 11 + 3 relapses | Very severe .. | Positive | — |
| 7 | Watson .. .. | 22.11.07 | 25.11.07 | 21 | 18 | Medium severity | ,, | — |
| 8 | Aldridge .. | 22.11.07 | 25.11.07 | 19 | 16 | ,, ,, | ,, | — |
| 9 | Else .. .. | 25.11.07 | 27.11.07 | 18 | 16 | ,, ,, | ,, | — |
| 10 | Bird .. .. | 27.11.07 | 1.12.07 | 14 | 11 | ,, ,, | ,, | — |
| 11 | Brown .. .. | 6.12.07 | 7.12.07 | 16 | 15 | ,, ,, | ,, | — |
| 12 | Wiltshire .. | 5.12.07 | 7.12.07 | 9 | 7 | Mild case .. | Negative | Culture taken towards end of case. |
| 13 | Wyeth .. .. | 11.12.07 | 12.12.07 | 22 | 21 | Medium severity | Positive | — |
| 14 | Roe, I. .. .. | 12.12.07 | 16.12.07 | 26 + relapses.. | 22 + relapses.. | Severe case .. | ,, | — |
| 15 | Marshall .. | 29.12.07 | 31.12.07 | 23 | 21 | .. .. .. | ,, | — |
| 16 | Dartnel .. .. | 29 12.07 | 31.12.07 | Died | | .. .. .. | ,, | Died during the febrile stage. |
| 17 | Sister H. .. | 1. 1.08 | 3. 1.08 | 31 | 29 | Severe case .. | Negative | Only 2 cc. of blood taken in culture |
| 18 | Martin .. .. | 5. 1.08 | 6. 1.08 | 20 | 19 | Medium severity | Positive | — |
| 19 | Batchelor .. | 4. 1.08 | 6. 1.08 | 7 + 3 relapses | 5 + 3 relapses | Very severe case | ,, | Patient inoculated twice, 1905 |
| 20 | Thompson .. | 8. 1.08 | 8. 1.08 | 20 + relapse .. | 20 + relapse .. | .. .. .. | ,, | — |
| 21 | Littlejohn .. | 12. 1.08 | 13. 1.08 | 5 | 4 | Very mild case.. | Negative | Patient inoculated twice, 1907. |
| 22 | Collister .. | 10. 1.08 | 13. 1.08 | 6 + relapse .. | 3 + relapse .. | Mild case .. | ,, | Culture taken towards end of first attack. |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 23 | Bevan | 12. 1.08 | 13. 1.08 | 18 + relapse | 17 + relapse | Severe case | Positive | — |
| 24 | Mills | 14. 1.08 | 15. 1.08 | 14 | 13 | Medium severity | ,, | — |
| 25 | Bridges | 15. 1.08 | 15. 1.08 | 28 | 28 | Severe case | ,, | — |
| 26 | Smith | 17. 1.08 | 18. 1.08 | 6 | 5 | Very mild case | Negative | Culture taken towards end of attack. |
| 27 | Jones | 17. 1.08 | 20. 1.08 | 6 | 3 | .. .. .. | ,, | |
| 28 | Morgan | 19. 1.08 | 20. 1.08 | 36 | 35 | Severe case | Positive | — |
| 29 | Ferguson | 19. 1.08 | 20. 1.08 | 34 | 33 | Severe case | Positive | Inoculated twice, 1907. |
| 30 | Crampton | 20. 1.08 | 20. 1.08 | 14 died | 14 died | — | ,, | Died in febrile stage of the disease. |
| 31 | Mrs. H. | 19. 1.08 | 23. 1.08 | 17 | 13 | Medium severity | ,, | — |
| 32 | Willicombe | 22. 1.08 | 23. 1.08 | 9 + 3 relapses | 8 + 3 relapses | Severe case | ,, | — |
| 33 | Turner | 27. 1.08 | 27. 1.08 | 12 | 12 | Mild case | ,, | — |
| 34 | Marsh | 21. 1.08 | 22. 1.08 | 15 | 14 | Medium severity | ,, | — |
| 35 | Thomas | 20. 1.08 | 21. 1.08 | 5 | 4 | Very mild case | Negative | — |
| 36 | Bairon | 24. 1.08 | 25. 1.08 | 7 | 6 | ,, ,, | ,, | Culture taken probably early in disease. |
| 37 | Lemon | 24. 1.08 | 25. 1.08 | 11 + relapse | 10 + relapse | Medium severity | ,, | — |
| 38 | Macklin | 25. 1.08 | 25. 1.08 | 14 | 14 | ,, ,, | Positive | — |
| 39 | Gwynne | 24. 1.08 | 25. 1.08 | 13 | 12 | ,, ,, | ,, | — |
| 40 | Pither | 24. 1.08 | 25. 1.08 | 13 | 12 | ,, ,, | ,, | — |
| 41 | King | 24. 1.08 | 25. 1.08 | 21 + relapse | 20 + relapse | Severe case | ,, | — |
| 42 | Doyle | 24. 1.08 | 25. 1.08 | 16 | 15 | Medium severity | ,, | — |
| 43 | Storey | 21. 1.08 | 22. 1.08 | 8 + relapse | 7 + relapse | ,, ,, | ,, | — |
| 44 | Richardson | 30. 1.08 | 30. 1.08 | 11 | 11 | Mild case | Negative | Culture taken late in disease. |
| 45 | Dodd | 29. 1 08 | 29. 1.08 | 12 | 12 | Medium severity | Positive | — |
| 46 | Noonin | 27. 1.08 | 27. 1.08 | 15 | 15 | ,, ,, | Negative | — |
| 47 | Cooke | 28. 1.08 | 29. 1.08 | 26 | 25 | Severe case | Positive | — |
| 48 | Hay | 28. 1.08 | 29. 1.08 | 19 | 18 | Medium severity | ,, | — |
| 49 | Roe II. | 29. 1.08 | 29. 1.08 | 15 | 15 | ,, ,, | ,, | — |
| 50 | Dawkins | 29. 1.08 | 29. 1.08 | 12 | 12 | ,, ,, | ,, | — |
| 51 | Kerton | 4. 2.08 | 5. 2.08 | 10 | 9 | ,, ,, | ,, | — |
| 52 | Corral | 4. 2.08 | 5. 2.08 | 22 | 21 | ,, ,, | ,, | — |
| 53 | Evans | 1. 2.08 | 3. 2.08 | 4 | 2 | Mild case | Negative | Culture taken too late. |
| 54 | Larnan | 2. 2.08 | 3. 2.08 | 11 | 10 | ,, | ,, | — |
| 55 | Tapley | 6. 2.08 | 7. 2.08 | 5 | 4 | Very mild case | ,, | — |
| 56 | Mahoney | 4. 2 08 | 4. 2.08 | 20 | 20 | Medium severity | Positive | — |
| 57 | Mars | 10. 2.08 | 10. 2.08 | 11 | 11 | ,, ,, | ,, | — |
| 58 | Evenden | 9. 2 08 | 10. 2.08 | 10 | 9 | ,, ,, | ,, | — |
| 59 | Crossman | 11. 2.08 | 12. 2.08 | 14 | 13 | ,, ,, | ,, | — |

TABLE I.—*Continued.*

| No. | Name | Date of admission | Date of blood culture | Number of days fever after admission | Number of days fever after blood culture | Nature of case | Result of culture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 60 | Cork .. .. | 17. 2.08 | 17. 2.08 | 25 | 25 | Severe case .. | Positive | — |
| 61 | O'Toole .. .. | 20. 2.08 | 20. 2.08 | 4 | 4 | Very mild case .. | Negative | Patient inoculated twice, 1907. |
| 62 | Gambell.. .. | 20. 2.08 | 20. 2.08 | 8 | 8 | Mild case .. | ,, | — |
| 63 | Holding.. .. | 22. 2.08 | 24. 2.08 | 14 | 12 | Medium severity | Positive | — |
| 64 | McLachlan .. | 28. 2.08 | 2. 3.08 | 18 | 15 | ,, ,, | ,, | — |
| 65 | Ford .. .. | 7. 3.08 | 9. 3.08 | 8 | 6 | Mild case .. | Negative | Culture probably taken early in disease. |
| 66 | Holland .. .. | 12. 3.08 | 12. 3.08 | 21 | 21 | Severe case .. | Positive | — |
| 67 | Jones .. .. | 27. 2.08 | 2. 3.08 | 9 | 4 | Mild case .. | Negative | Culture probably taken early. |
| 68 | Spencer .. .. | 16. 3.08 | 18. 3.08 | 9 | 7 | ,, .. | ,, | Culture taken late in disease. |
| 69 | Spooner .. .. | 20. 3.08 | 21. 3.08 | 3 | 2 | ,, .. | ,, | ,, ,, ,, |
| 70 | Jarvis .. .. | 21. 3.08 | 21. 3.08 | 2 | 2 | ,, .. | ,, | ,, ,, ,, |
| 71 | Flynn .. .. | 30. 3.08 | 6. 4.08 | 26 + relapse .. | 20 | Severe case .. | Positive | — |
| 72 | Byrd .. .. | 19. 4.08 | 24. 4.08 | 3 + 18 relapses | 14 of relapse .. | Medium severity | ,, | — |
| 73 | Malthouse .. | 21. 4.08 | 23. 4.08 | 7 | 4 | Mild severity .. | Negative | — |
| 74 | Smith .. .. | 18. 4.08 | 22. 4.08 | 14 | 10 | Medium severity | ,, | — |

In the first series of thirty-seven cases in which the bile method of culture was employed, the quantity of blood removed from the patient's finger was comparatively small, less than ½ cc. on an average. The percentage of successful results in this series of cases worked out at 51 (eighteen out of thirty-seven cases).

In the present series of cases an attempt was made to obtain a larger amount of blood than 0·5 cc., and also to approximately gauge the amounts of blood employed for cultures in the various cases. By using small test-tubes of approximately equal calibre and by measuring the amount of blood and bile used in one or two cases, these requirements have been fulfilled. In the series of seventy-four cases enumerated in Table I., approximately 1 cc. of blood was used for cultures in seventy-two, and placed in 4 cc. of sterile ox-bile. Of the other two cases, in one (Kirby) a much larger amount of blood—about 4 cc.—was used, while in the other (H.), owing to the patient's condition, only very little blood (about 0·2 cc.) could be obtained.

### RESULTS OBTAINED FROM THIS SERIES OF SEVENTY-FOUR CULTURES, AND THE NATURE OF THE BACTERIA ISOLATED.

From these cases (one culture only from each case being taken) pure cultures of typhoid or paratyphoid bacteria were obtained on forty-five occasions, and a mixed culture of typhoid bacilli and staphylococci in three others. In five cases pure cultures of staphylococci were found on the agar plates, while the latter were sterile on twenty-two occasions. It is probable that these staphylococci were contaminations, the source of contamination being the skin of the patient's fingers.

### PERCENTAGE OF SUCCESSFUL RESULTS OBTAINED.

As one of the objects of this investigation was to ascertain the clinical value of the finger method of blood culture, the two cases (Kirby and H.) where very large and very small amounts of blood had been employed for cultures have been eliminated from all calculations. The amount of blood employed in the remaining seventy-two was approximately 1 cc., an amount which can readily be collected from a finger pulp, thus rendering this method of culture a clinical and practical one. From these seventy-two cultures (from seventy-two cases), organisms of the typhoid-colon group were isolated in forty-seven (*i.e.*) in 65·3 per cent. of all the cases. An attempt is made in this paper to ascertain the circumstances which influence the success or failure of the bile method of culture, the inquiry being directed on two lines of research.

It has long been suspected that typhoid bacilli enter the blood-stream at a very early stage of typhoid fever, and diminish greatly or disappear from it towards the end of the febrile period. That this idea has foundation in fact will, I think, be recognised after the perusal of the two Tables (I. and II.) attached to this paper. Table I. gives a list of the

TABLE II.—SHOWING THE RELATION BETWEEN THE RESULTS OF BLOOD CULTURES AND SERUM (AGGLUTINATION) TESTS. THIS TABLE WAS COMPILED WITH A VIEW TO APPROXIMATELY FIXING THE DAY OF FEVER ON WHICH A CULTURE WAS TAKEN BY CHECKING THE RESULTS OF BLOOD CULTURE BY MEANS OF SERUM TESTS MADE AT THE SAME TIME.

| Name | Date of taking culture | No. of days fever after taking culture | Culture result | Date of taking Widal | Result of Widal test | Remarks |
|---|---|---|---|---|---|---|
| Hollingsworth .. | 13.11.07 | 5 | Negative | 13.11.07 | Positive | Culture taken late in disease. |
| Dixon .. .. | 14.11.07 | 11 | Positive | 14.11.07 | ,, | — |
| Watson .. .. | 25.11.07 | 18 | ,, | 26.11.07 | Negative | Widal positive, 11.12.07; culture taken early. |
| Aldridge .. .. | 25.11.07 | 16 | ,, | 26.11.07 | ,, | ,, |
| Else .. .. | 27.11.07 | 16 | ,, | 30.11.07 | Incomplete | ,, |
| Brown .. .. | 7.12.07 | 15 | ,, | 7.12.07 | Negative | Widal positive, 12.12.07; culture taken early. |
| Wiltshire .. .. | 7.12.07 | 7 | Negative | 7.12.07 | ,, | ,, |
| Collister .. .. | 13. 1.08 | 3 | ,, | 17. 1.08 | Positive | Culture taken late in disease. |
| Jones .. .. | 20. 1.08 | 5 | ,, | 22. 1.08 | ,, | ,, |
| Marsh .. .. | 22. 1.08 | 14 | Positive | 25. 1.08 | Negative | Widal reaction; slightly positive, 28.1.08. |
| Bairon .. .. | 25. 1.08 | 6 | Negative | 25. 1.08 | ,, | ,, 29.1.08. |
| Lemon .. .. | 25. 1.08 | 10 | ,, | 28. 1.08 | Positive | Culture taken late in disease. |
| Gwynne .. .. | 25. 1.08 | 12 | Positive | 25. 1.08 | Negative | Widal positive, 29.1.08. |
| King .. .. | 25. 1.08 | 20 | ,, | 1. 2.08 | ,, | Culture taken early. |
| Richarsdon .. | 30. 1.08 | 11 | Negative | 1. 2.08 | Positive | Culture taken late. |
| Evans .. .. | 3. 2.08 | 2 | ,, | 4. 2.08 | ,, | ,, |
| Evenden .. .. | 10. 2.08 | 9 | Positive | 11. 2.08 | ,, | ,, |
| Cork .. .. | 17. 2.08 | 25 | ,, | 18. 2.08 | Negative | Culture taken early. |
| O'Toole .. .. | 20. 2.08 | 4 | Negative | 21. 2.08 | Positive | Culture taken late. |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Gambell** .. .. | 20. 2.08 | 8 | Negative | 21. 2.08 | Positive | Culture taken late. |
| **Holding** .. .. | 24. 2.08 | 12 | Positive | 25. 2.08 | Negative | Culture taken fairly early in disease. |
| **Ford** .. .. | 9. 3.08 | 6 | Negative | 10. 3.08 | ,, | Widal reaction positive, 14.3.08; probably very mild case, admitted early. |
| **Jones** .. .. | 2. 3.08 | 4 | ,, | 5. 3.08 | ,, | Widal reaction positive, 10.3.08; same as above. |
| **Spencer** .. .. | 18. 3.08 | 7 | ,, | 16. 3.08 | Positive | Admitted late in disease. |
| **Jarvis** .. .. | 21. 3.08 | 2 | ,, | 21. 3.08 | ,, | ,, |
| **Flynn** .. .. | 6. 4.08 | 20 | Positive | 6. 4.08 | Incomplete | Widal reaction positive, fourteen days late. |
| **Malthouse** .. | 23. 4.08 | 4 | Negative | 23. 4.08 | Positive | Admitted late in disease. |
| **Smith** .. .. | 22. 4.08 | 10 | ,, | 23. 4.08 | ,, | ,, |
| **Mingan** .. .. | 27.10.06 | 10 | Positive | 25.10.06 | Incomplete | — |
| **Moore** .. .. | 27.10.06 | 8 | ,, | 25.10.06 | ,, | — |
| **Dickenson** .. | 15.11.06 | 7 | Negative | 9.11.06 | Positive | Culture probably taken late in disease. |
| **Dry** .. .. | 15.11.06 | 6 | ,, | 14.11.06 | ,, | ,, |
| **Aitcheson** .. | 26.11.06 | 12 | Positive | 26.11.06 | ,, | Culture taken in second week. |
| **Wells** .. .. | 23. 1.07 | 12 | ,, | 25. 1.07 | Incomplete | ,, |
| **Jackson** .. .. | 29. 1.07 | 7 | Negative | 25. 1.07 | Positive | Admitted late in disease. |
| **Russell** .. .. | 29. 1.07 | 7 + relapse | Positive | 30. 1.07 | ,, | — |
| **Hards** .. .. | 29. 1.07 | 8 | Negative | 28. 1.07 | ,, | Admitted late in disease. |
| **Tragenza** .. .. | 7. 2.07 | Died | Positive | 7 .2.07 | Negative | Died during febrile stage. |
| **Milson** .. .. | 7. 2.07 | 6 | Negative | 7. 2.07 | Positive | Admitted late in disease. |
| **Orange** .. .. | 13. 2.07 | 9 | Positive | 12. 2.07 | Negative | — |
| **O'Connor** .. .. | 28. 2.07 | 4 | Negative | 28. 2.07 | Positive | Admitted late in disease. |
| **Warne** .. .. | 3. 3.07 | 10 | Positive | 3. 3.07 | ,, | ,, |
| **Wilson** .. .. | 5. 3.07 | 12 | ,, | 3. 3.07 | ,, | ,, |
| **Ward** .. .. | 5. 3.07 | 8 | ,, | 5. 3.07 | Incomplete | — |

cases from which cultures were made, the dates on which these cultures were taken, and the number of days of fever supervening after the culture had been taken. I adopted this method of ascertaining, in any particular case, at what period of the fever a culture had been taken for the following reasons. In South Africa the typical three weeks fever chart is not often seen in hospital. This is often due no doubt to the fact that many cases come to hospital late in the disease. It is also due, as will be shown later, to a certain number of very mild cases, where the febrile period is short and the temperature rules low. There are other cases again where the temperature chart shows a febrile period of considerably greater duration than three weeks. Attempts were made to fix the date of onset of the disease, and thus calculate more accurately the duration of the fever by cross-questioning the patients; but all such efforts to ascertain at what particular period of the disease a blood culture had been made proved futile, and were abandoned as unreliable.

For these reasons it was considered advisable to ascertain the period of fever by calculating from two fixed points: (1) The date on which the temperature became normal; (2) the date on which the blood culture was taken in each case. By this method one could at least be certain of the number of days of fever supervening after a culture had been taken, and it obviated such generalities as "taken in the second week of the disease" or "on the tenth day," &c. Working on this principle, it will be seen by the data in Table I. that: (1) In both those cases in which patients died during the febrile stage of the disease, culture results were positive. (2) In those in which more than twenty days of fever remained after the culture was taken, a positive result was obtained in all (fourteen out of fourteen), or 100 per cent. It is probable that in these cases the culture was taken in the very earliest stage of the disease. (3) When from fourteen to twenty days of fever supervened after a blood culture, successful results were obtained in fifteen out of sixteen cases (*i.e.*) a percentage success of 93 per cent. in those cases in which the culture was taken in what was probably the first week of the disease. (4) When ten to fourteen days of fever remained after the culture was taken, growths of the typhoid-colon group were obtained in ten out of fourteen cases, a percentage success of 71 per cent. in what may have been the early days of the second week of fever. (5) In those cases in which the patients only suffered from seven to ten days of fever after a culture had been taken, positive results were obtained in four out of nine cases, or 44 per cent. (6) Lastly, when fewer than seven days of fever remained after the blood culture, positive results were obtained in two only of seventeen cases (*i.e.*) but 12 per cent. of the total.

From the data on Table I. alone, it would be difficult or impossible to say at what period of the disease blood cultures had been taken in the cases included under groups 5 and 6; and it was with a view to gaining information on this and other points that Table II. was compiled. In

Table II. an attempt has been made to approximately fix the day of fever on which cultures were taken by checking the results obtained from blood cultures by means of serum reactions. In looking back over the records of the 111 cases of typhoid and paratyphoid fever from which I had made blood cultures, I found forty-four in which both a blood culture and a Widal test had been carried out within three or four days of each other. On examining the data on Table II., it will be seen that as a rule when blood cultures were obtained from the blood in typhoid disease, the serum (agglutination) test was negative; whereas when agglutinations were present in the blood in sufficient amount to give a positive test, cultures could not be obtained. In thirty-four of the forty-four cases given in Table II. this rule is followed. Of these thirty-four cases, in eighteen the Widal test was positive and the culture result negative. In the other sixteen cases where cultures were obtained, the serum reaction was negative or incomplete. Ten of the forty-four cases seem to point an exception to the rule of "negative culture—positive Widal" mentioned above. In six of these ten cases, cultures were obtained from the blood, notwithstanding the presence of a positive serum test. They were all cases of medium severity. In four cases both blood culture and Widal test were negative, as the serum test, when repeated some five to six days later, was positive in each of these cases. It is probable that we had to deal here with very mild cases.

## CONCLUSIONS.

The results obtained in this series of seventy-four cases tend to show that even when such small amounts of blood as 1 cc. are used for purposes of culture, positive results can be obtained in over 90 per cent. of cases of typhoid of medium severity, if the culture is taken within ten days of the onset of the disease.

As 1 cc. of blood can readily be obtained from a finger pulp, and further, as the use of bile as a culture medium is simple and easy of application, this method of culture should be one of great value for the early diagnosis of typhoid fever.

In those cases of typhoid where cultures by this method failed, a positive agglutination reaction could usually be obtained by testing the patient's blood serum. It follows from this that by carrying out a blood culture and a serum test in each instance, few cases of typhoid fever would escape diagnosis within twenty-four hours.

It may have been noticed that the nature of the organisms isolated from the blood or reacting to the serum test has not been defined in Tables I. and II. This course was adopted as the various strains of bacteria isolated from these seventy-four cases are, along with others, being tested in a long series of carbohydrate media by Dr. May (Bacteriologist to the Transvaal Government) and myself.

It was considered advisable to await the result of this investigation before classifying the various bacteria.

# Travels.

## THE BURIED CITIES OF CEYLON.

By Major F. W. BEGBIE.
*Royal Army Medical Corps.*

Having recently returned from a visit to the Buried Cities of Ceylon, I thought a description of the Ruins might be of interest to some of my brother officers who, like myself, are quartered in India, and during the leave session like to visit places of interest. Now that the railway has been opened from Colombo to Anuradhapura the journey presents no difficulty.

In order to follow the history of the "Buried Cities," it is necessary to go back as far as the middle of the sixth century B.C. It was at this date that Ceylon, or Lanka, as it was then called, was first inhabited. The island was attacked by an expedition under the leadership of Vijaya, son of the King of Bengal. According to old mythology, Vijaya's grandfather was supposed to have been "Sinha," or a lion, and Vijaya gave the name of "Sinhalese" to his followers, who spread out and settled all over the island, founding the cities of Upatissa, Uruvela, and Anuradhapura, now called the "Buried City." It is popularly supposed that the religion of the early settlers was "Brahmin." Very little is known of the history of Ceylon at this period, beyond the fact that the island was constantly being invaded from India. Sometimes the invaders were victorious, sometimes the "Sinhalese." These various wars continued until the end of the fourth century B.C., when we find King Devanampiya-Tissa reigning on the throne of Ceylon, with the City of Anuradhapura as his capital. At the same date, in India, King Asota reigned in Bengal, with his headquarters at Magadha, 200 miles from Benares. Contemporaneously, Gautama Buddha was nearing his nirvana, and had almost finished his teaching on earth. The fame of his learning had spread to Magadha, and King Asota had been converted from Brahminism to Buddhism. We have good reason to believe that King Asota and King Tissa of Ceylon were on good terms, and were in the habit of exchanging presents. In writing to King Tissa, King Asota of Bengal mentions his conversion to Buddhism, and begs King Tissa to adopt the four great Buddhist dogmas, viz.:—

(1) Existence in sorrow.
(2) Desire for existence is the cause of sorrow.

(3) The cessation of sorrow is effected by the eradication of desire.

(4) The way of living which leads to the practice of right faith, right resolve, right speech, right meditation, and right living.

These four dogmas, if rightly carried out, will bring about a favourable re-birth, with the total elimination of sorrow and desire, in the next life. At the beginning of the third century B.C., King Asota of Bengal sent his son "Mahinda-Thera," with two Buddhist monks, to Ceylon, in order to push forward his Buddhist propaganda. History says that in June, 308 B.C., King Tissa went on a hunting expedition, in the course of which he reached a hill, some 12 miles from the city of Anuradhapura. The King and his followers hunted the quarry to the summit of this hill, where they came suddenly on the envoys of King Asota. The Buddhist priests addressed King Tissa in the following words: "O Maha Rajah, we are the ministers and disciples of the Lord Jautama Buddha, and in compassion for thee we have repaired hither." The Buddhist priests then proceeded to convert the King and his followers, who in turn converted the people. The hill on which this conversion took

PHOTO. 1.—"Thuparama Dagoba." First shrine built by King Tissa, over the left collar-bone of Buddha, date 300 B.C.

place was named "Mahintale," after the king's son Mahinda-Thera, and is so called to this date. Further, to commemorate this great event, the first of the enormous dagobas, which form a large portion of the ruins of the Buried Cities, was built close to the capital of Anuradhapura. This dagoba was named the "Thuparama Dagoba," and was commenced in 300 B.C. (photo. 1). This dagoba was built over the relic of the left collar-bone of Gotama Buddha, which the King of Ceylon had obtained from King Asota of Bengal. As will be seen from the photograph, the dagoba is still in an excellent state of preservation. The upper part only has been restored, the lower portion remaining as it was found on excavation, some twenty-five years ago. Of the one hundred and sixty-seven original pillars surrounding the dagoba only thirty-seven now remain. They are supposed to be remains of a roof built over the dagoba in 119 B.C. The pillars are slender monoliths of elegant proportions, with beautiful carvings on the capitals, and remain now as they were in 300 B.C. The ruins of the Buried Cities cover a distance of 16 square miles, and the City was then, as now, divided into two portions, the "Sacred City" and the "Political City." Owing to

PHOTO. 2.—"Rock Temple, Issurumuniya," of King Tissa, Anuradhapura, 300 B.C.

PHOTO. 3.—"The Queen's Bath," next to "The King's Bath."

PHOTO. 4.—Remains of the "Brazen Palace," 1,600 granite pillars embedded in 12 feet of earth above marble floor, nine storeys high.

the large area covered by the ruins, only the chief of those which have been excavated can be described here. The modern excavations were begun when Sir William Gregory was Governor, some thirty years ago.

Another temple ascribed to the reign of King Tissa, 300 B.C., is the "Issurumuniya Rock Temple" (photo. 2). This temple has been hewn out of the solid rock, and inside are to be found various images of Buddha, also carved out of the rock. Until recent years the temple was overgrown with a mass of undergrowth, which has now been removed. A modern entrance has been recently built, very much out of keeping with the ancient rock-building. On the outside of the rock face are to be seen numerous remarkable frescoes and sculptures in bas-relief. "The Queen's Bath" (photo. 3). This is only partially excavated at present, and, as seen in the picture, the excavated portion has been restored with the original stones. Of a later date, 164 A.D., in the reign of King Dutthagamini, is the "Brazen Palace," seen in photo. 4. This palace consisted of 1,600 granite pillars, which supported a mansion nine storeys high. On each storey were 100 apartments for Buddhist priests. The beautifully carved pillars, as seen at the present day, are still embedded in 12 feet of earth, before the original marble flooring is reached. The building was originally covered over with brazen tiles, hence its name. "The Ruanweli Dagoba," or gold dust dagoba (photo. 5). This enormous monument of the reign of King Dutthagamini was begun in the year 200 A.D. It is built entirely of brick, is 270 feet high, and the base covers an area of 5 acres. In the centre was a large chamber which contained the Holy Relics. The stone-paved platform which surrounds the base is most interesting. The revetment wall, where not covered with *débris*, shows an unbroken line of elephants, standing shoulder to shoulder, and appearing to bear the whole weight of the dagoba on their backs. I regret that the photograph gives such an imperfect impression of the great size and grandeur of this ancient ruin. The dagoba, as seen in the picture, is now undergoing restoration. The stone statues which are being worshipped are those of King Dutthagamini on the left and three Buddhist monks on the right. The figures are wonderfully well preserved considering their great age.

In the year 289 A.D., in the reign of Maha Sen, the "Jetawanarama Dagoba" (photo. 6) was built. Up to the present date only the pillars at the base have been excavated; the rest of the dagoba is still covered with centuries of undergrowth. It is without doubt a brick structure, the same as the Ruanweli dagoba.

PHOTO. 5.—"Ruanweli Dagoba," with pilgrims worshipping. Three Buddhist statues; the large one King Dutthagamini.

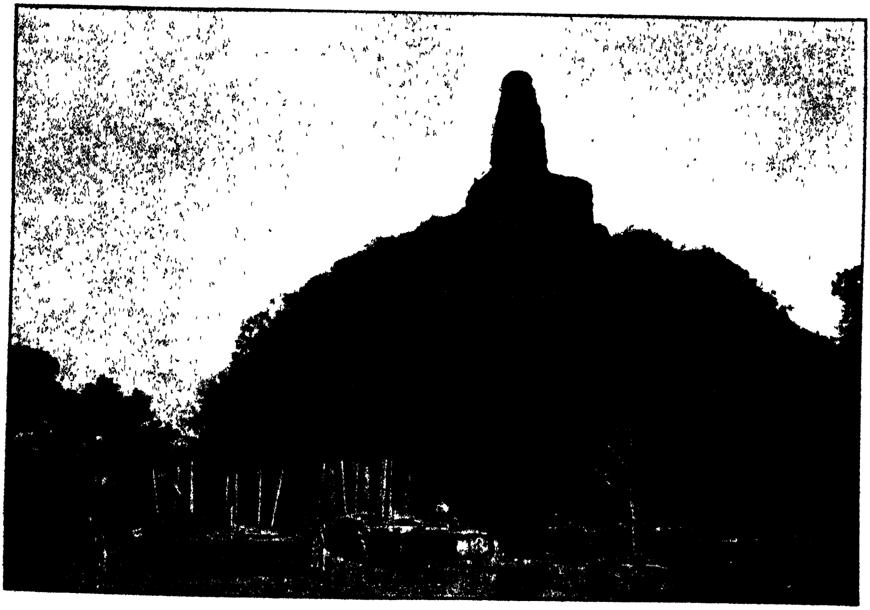

PHOTO. 6.—"Jetawanarama Dagoba." Reign of King Maha Sen.

It may be here remarked that it was not entirely religious enthusiasm which induced different kings to build these gigantic monuments. The work necessitated the labour of nearly all the population, and so by keeping the people employed revolution was prevented and each worker was encouraged to believe that he was "acquiring merit" through his labours.

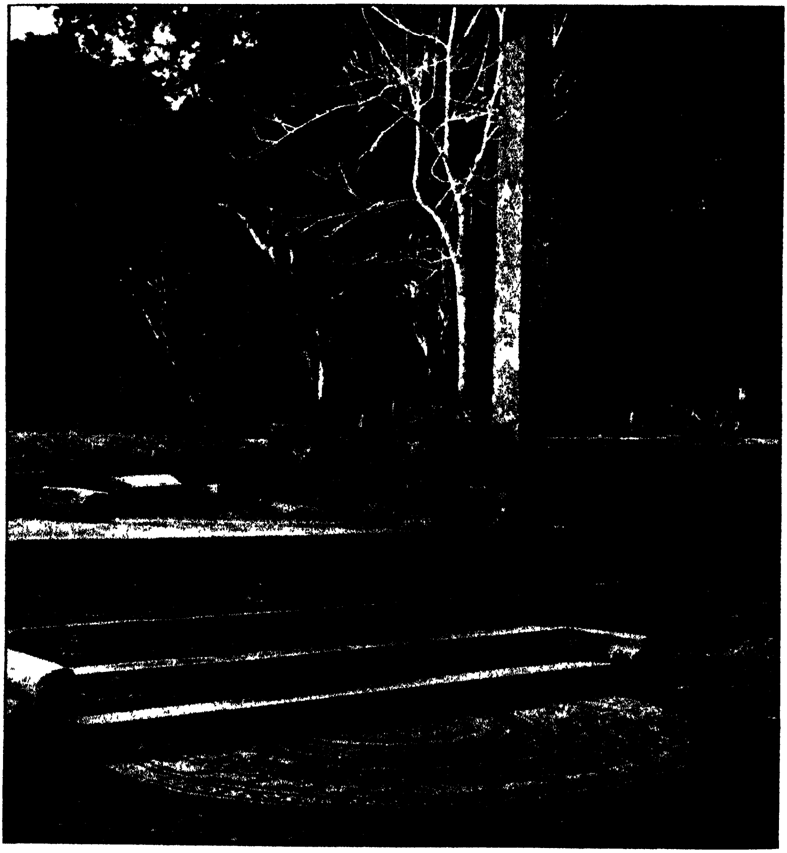

PHOTO. 7.—"Moonstone" and steps.

Photograph 7 shows a very well-preserved entrance to a temple, guarded by its several gods and surrounded at its base by a semi-circular doorstep called a "moonstone." The moonstone consists of four concentric ornamented semicircles, the outer one of foliage, the next a series of animals, the third another row of foliage, the last a row of geese, enclosing in the centre a full-blown lotus. This excellent specimen dates from 300 A.D. All temple entrances had moonstones, but none are so well preserved as this one.

My last photograph (No. 8) shows the "Temple at Kandy" erected to house the tooth of Buddha, and known under the name of the "Dalada Maligawa." In the centre of this temple is a small chamber containing a huge silver dagoba. This dagoba has six inner shrines, each studded with gems, the doors to which are opened by six different keys, kept by different persons. Inside the innermost shrine, upheld on a twist of gold wire, arising from the centre of a golden lotus blossom, is seen the tooth of Buddha, an object of the greatest veneration to 400 millions of people.

PHOTO. 8.—"Dalada Maligawa," or "Temple of Tooth," Kandy.

## Reviews.

ON MEANS FOR THE PROLONGATION OF LIFE. By Sir Hermann Weber, M.D., F.R.C.P. London: John Bale, Sons and Danielsson, Ltd., 1908. Price 4s. 6d. net.

This book embodies the thought and ripened experience of a physician who has been in practice sixty years. It is invaluable in the fact that the worth of the precepts inculcated in its pages has been proved by experiment. In his long and distinguished career, the author has seen that the lives of those who have lived by his rules have been lengthened, while members of the same family who have not followed this regimen have succumbed long before their better instructed brothers and sisters.

He purposely avoids the vastly important subject of the education of childhood and youth in the fundamental hygienic principles, and is concerned only with the health of persons in the fifth decade and onwards, the death-rate of whom has scarcely decreased in the last forty years. He has investigated the habits of over one hundred long-lived individuals. They were mostly temperate, small meat-eaters, lived much in the open air, led an active life, were early risers, and of buoyant disposition. He maintains that numerous deaths between 50 and 70, due to cardiac and vascular degenerations, might have been retarded by great moderation in food and alcohol, and by regular exercises, of which the best is walking one-half to three hours daily.

His experience on the influence of alcohol coincides with the results of the collective investigation returns of the British Medical Association and Life Office statistics. In common with all who read the evidence before them, he recognises that alcohol is a source of enjoyment, transient, perhaps, but real for the moment. But it can be indulged in only with detriment to the bodily welfare. So insidious is the advance of the decay that the subject is seldom conscious of it. It becomes a question for each man to decide whether or no he is prepared to sacrifice a span of life and a portion of his health, vigour and intellect, for the pleasure arising from the use of intoxicants. Let him not delude himself with the belief that he can pluck the rose without the thorn. C. B.

WHEN TO OPERATE IN INFLAMMATION OF THE APPENDIX. By C. Mansell Moullin, M.D.Oxon., F.R.C.S. Third edition. Pp. 48. London: John Bale, Sons and Danielsson, Ltd., 1908. Price 2s. 6d. net.

Few questions in practical surgery have aroused more controversy than the subject dealt with in the four clinical lectures that compose this little book, and even at the present time considerable differences of opinion and practice exist. While most surgeons agree that the slightest cases of appendicitis need no immediate interference, and all agree as to the urgent need for operation in fulminating cases, it is in the large class where the attack is of moderate severity that the question of "when to operate" is most difficult to answer. The author strongly advocates early operation in such cases, if seen in time, and his arguments in favour of this course are convincing. The treatment of cases that are not seen till the most favourable time for operation is passed is fully discussed, and in the concluding lecture the practical significance of the more important symptoms is estimated and analysed.

The book is one that will be read with profit by all military surgeons, and may be strongly recommended to the readers of this Journal.

C. G. S.

MILITARY LAW MADE EASY. By Lieutenant-Colonel S. T. Banning, late Royal Munster Fusiliers. Fourth edition, revised with the assistance of Captain R. F. Legge, Leinster Regiment. Pp. 332. London: Gale and Polden, 1908. Price 4s. 6d. net.

In the fourth edition of this well-known work, Lieutenant-Colonel S. T. Banning, with the assistance of Captain R. F. Legge, has brought his book fully up to date, in accordance with the new editions of the Manual of Military Law and King's Regulations, and the amendments thereto.

The only omission noted is in the chapter on the Customs of War, in which no mention is made of the Geneva Convention of 1906, but as chapter xiv. of the Manual has not yet been rewritten the omission does not detract from the value of this book to officers preparing for examination.

As before, complete lists of references are given for each subject, enabling officers to check, and if necessary amplify, the references in their own copies of the Manual. E. T. F. B.

THE MILITARY LAW EXAMINER. By Lieutenant-Colonel S. C. Pratt, Royal Artillery (retired). Seventh edition. Pp. 317. London: Gale and Polden, 1908. Price 4s. 6d. net.

A seventh edition has been published, revised up to August, 1908.

This book is arranged in the form of questions and answers, and, as the preface states, the reader is advised to verify the answers, and note in the margin of his copy the references to the official books. So used, Colonel Pratt's work should be of great assistance to officers preparing for examinations, showing them how to answer questions, and giving them practice in turning up references.

No mention is found of the power recently conferred on Commanding Officers of awarding field punishment and forfeiture of pay on active service. E. T. F. B.

MANUAL OF OPHTHALMIC OPERATIONS. By Lieutenant-Colonel F. P. Maynard, F.R.C.S., I.M.S. Pp. 223. Calcutta: Thacker, Spink and Co., 1908. Price 9s.

This is a book which can confidently be recommended to all taking up the practice of ophthalmic surgery. Written, as it appears to be, mainly from the results of Indian experience, it should appeal more especially to operators in tropical and subtropical countries where the ample resources of an ophthalmic hospital at home are not available, and surgical technique has, in consequence, to be modified.

Useful hints are given on the selection, testing, and care of instruments, and on the choice of dressings, with especial regard to the difficulty in securing absolute asepsis in an Indian hospital.

The operations are clearly and simply described, step by step, and one noticeable feature is the presentation of the diagrams and stereoscopic plates, as well as the mode of operating, from the operator's—not the spectator's—point of view, a system which undoubtedly increases the practical value of the work. The various accidents and complications which may arise during or after an operation, their remedies, and the after-treatment of operation cases, are carefully gone into, and the indications for each operation are fully described. E. T. F. B.

# Current Literature.

**The Army Medical College for the French Colonial Medical Service at Marseilles.** (Decree of May 7th, 1908. *Bull. Off. du Ministère de la Guerre.*)—A decree of May 7th, 1908, modifies the organisation of the Colonial Army Medical College, organised at Marseilles in 1905. The course is to last from February 1st to November 1st, instead of to October 1st; one-half of the students being given one month's leave in July and the other half in August, so as not to interfere with the work of the hospital. The two examinations held every three months are replaced by an examination at the end of each term. The officers in charge of clinical wards and studies are designated "Assistant Professors," and a disciplinary board is appointed to deal with offences, as in the Val-de-Grâce.

The decree details in full the organisation of the college so as to introduce these modifications. The staff will consist of a director, an assistant director, a medical officer in professional charge, and a quartermaster. There will be one professor and one assistant professor for each of the following subjects: (1) Tropical Diseases; (2) Military Surgery and Special Diseases; (3) Bacteriology, Parasitology, Military and Colonial Hygiene, Sanitary Police, and Epidemiology; (4) Surgical Anatomy and Operations; (5) Chemistry, Toxicology, Pharmacy, and Colonial Medical and Surgical Supplies. The professor and assistant professor of this subject are pharmacist officers. A sixth subject, namely, Medical Jurisprudence, Administration, and Medical Service in the Colonies, is taught by the medical officer in professional charge of the college.

The professors are appointed for two years, and their appointment can be extended for two successive periods of one year by the Minister of War.

Special instruction is given all the year round to medical officers and pharmacists on leave from the colonies, more particularly in the period November 1st to February 1st, when the regular course is not being held. Civilians not connected with the military medical services may attend these courses, as well as foreigners on application through their Embassy. W. G. M.

**Notes on the Changes which take place in the Ration Bread of the French Army.** (Article in *Arch. de Méd. et Ph. Mil.*, by Pharm.-Maj. Jalade.)—In an article on the above subject, in which a chemical and biological study is made of the *Monilia sitophila*, the chief agent in the production of changes in the bread, the author gives the following conclusions:—

(1) The alterations caused by the *M. sitophila* are very rare, as this fungus offers little resistance to heat and acidity.

(2) All chances of infection from materials and utensils used in the making of bread should be very remote, as the fungus is entirely destroyed during the process of baking.

(3) The germs of the *M. sitophila* are probably in the atmosphere.

The primary origin is essentially variable; its presence is first intimated by the appearance of red mildew after two or three days.

(4) The germs are specially noticed on broken bread, and very seldom on whole loaves. Should they be seen on the latter, they will always be found in the cracks and crevices of the crust.

(5) The foodstuffs most favourable to its growth are those which are exceptionally rich in fatty substances.

(6) It was found at Toulouse that yeast which was not acid was favourable to its development.

(7) Bread, after its distribution to the troops, is not sufficiently protected from contamination. It ought not to be kept in rooms where it is exposed to dust, variations of atmosphere, and foul air.

(8) Bread should always be kept in cupboards covered with wire gauze which will admit air but not insects, the latter being active agents of every kind of contamination.

W. G. M.

**Notes on Results of Physical Training in the French Army.** By Aide-Major Léard.—These notes show the results of observations made on six companies of infantry in order to determine (1) the influence of physical training and of breathing exercises; and (2) the value of military training for the less robust.

The author commences by drawing attention to the unsatisfactory condition of muscular development and of the general health of recruits taken from the labouring classes. He then points out that after six months physical training the men's powers of endurance and of resisting fatigue had remarkably improved, and attributes this, in the first place, to the various physical training exercises. He says, however, that he is not in favour of jumping exercises repeated eight, ten, fifteen, or more times on end, as he has found such apt to induce varicose veins, and he proceeds to give a striking example in support of this. For the same reason he disapproves of the men being made to carry arms or stand at attention for long periods.

With reference to breathing exercises, the author lays great stress on these, and is emphatic as to the favourable results obtained in most cases by exercises consisting of raising and lowering the arms in conjunction with regulated inspiration and expiration. He remarked, however, that some of the men showed no improvement whatever, and that others actually showed a slight deterioration of lung power after a course of the exercises. This the author attributes to want of careful individual attention, as some of the men's lungs are in an abnormal condition and require treatment accordingly. He also thinks that, either from a mechanical application of the rules or from want of proper comprehension, the instructors are apt to bring into play muscles which act only under exceptional circumstances. The author observes that it is the diaphragm that must be educated. All anatomical treatises insist on the importance of the diaphragm, and the effort of breathing should affect the abdominal cavity and cause the expansion of the lower portion of the thorax. After adducing proof of the truth of this, the author remarks that not only should the muscles be developed but also the intelligence.

Regarding the value of physical training for the less robust, full details are given of a particular case of a young soldier who joined in a very bad state of health, suffering especially from weakness and a defective digestion, but who in the course of a few weeks was transformed into a healthy man. Eight diagrams showing improvement in weight of as many individuals are given, and the author declares himself convinced that modern methods of physical education, as applied individually to soldiers, are responsible for the improved state of health of the army.

The conclusions arrived at are:—

(1) That young soldiers develop and improve in health during their service.

(2) That certain exercises, such as jumping, are not entirely to be recommended.

(3) That breathing exercises are based upon a principle not fully comprehended. The exercises themselves should certainly be continued, but they are insufficient. The diaphragm should be brought into play.

W. G. M.

**Notes on the Necessity of Providing Field Medical Units with Anti-tetanic Serum.** (Article in *Arch. de Méd. et Ph. Mil.* by Méd.-Major Vallet.)—Méd.-Major Vallet, in this article, after remarking that now, more than ever, there is a tendency to tetanus occurring in wounds on the battlefield, proceeds to insist upon the necessity of all medical units being provided with large quantities of anti-tetanic serum. The reason for this is that the serum must be injected very soon after the wound has been inflicted if tetanus is to be prevented. Acknowledging the difficulty of keeping a large supply in liquid form, he strongly recommends that dried serum should be used, a solution to be made whenever required. For this plan he urges the following advantages: The serum will keep for an indefinite period when dried; the Pasteur Institute recommends its use in this form if it is not wanted for immediate use; a large quantity makes a package of light weight and small bulk, and it could therefore easily be carried in panniers or haversacks. The preparation of dried serum for injection is extremely simple, for it requires only to be dissolved in boiling water.

He calculates that for an Army Corps of 30,000 men in the field 1,000 doses would be required, and these doses should be apportioned out as follows: 175 to the Corps ambulance; 125 to each divisional ambulance; 75 to the cavalry ambulance; and 500 to the field hospitals. Each dose weighs 1 gramme, and the author suggests that the serum should be packed in quantities sufficient for one, five, ten, and twenty injections. When a wounded soldier is brought in, a certain quantity of serum should be injected as a preventive measure, if the nature of the wound makes such a course advisable.

The question of expense should not be a difficulty in the way of this much needed reform, as therapeutical serums are not commercial products, and the Pasteur and provincial Institutes would probably be patriotic enough to provide the serum at a low cost. W. G. M.

**New Field Dressings for the French Army.**—Field dressings have been introduced into the French Army consisting of three different-sized packages, small, medium, and large. Each dressing has the same kind of material, the only difference being in size, and contains:—

(1) A roll of charpie enclosed in gauze.

(2) Two compresses, one of gauze containing charpie, and the other of six folds of gauze without charpie.

(3) Two bandages of fine cotton, except in the case of the small-sized dressing, which has only one bandage.

(4) In the large-sized and medium dressing one of the bandages will be attached to the end of the roll of charpie, the other will be free. The single bandage of the small-sized dressing will be free.

(5) Six safety pins for the large, four for the medium, and two for the small-sized dressing.

All the dressings will be aseptic.

The large-sized dressing forms a roll about 12 inches long and 2½ inches in diameter, weighing about 13½ ounces (380 grammes). The roll of charpie is about 1⅓ yards long and 12 inches wide. The compresses are 12 inches by 9 inches in size, and the bandages 6½ yards long by 4 inches wide.

The medium-sized dressing measures about 9 inches, with a diameter of 2 inches, and weight of about 9 ounces (260 grammes). The roll of charpie is 31 inches long and 9 inches wide; the compresses are 9 inches square, and the bandages 5⅓ yards long by 4 inches wide.

The small-sized dressing measures about 6 inches, with a diameter of about 1¾ inches, and a weight of about 4 ounces (113 grammes). The roll of charpie is ½ yard long and 6 inches wide. The compresses are 6 inches square, and the bandage 5⅓ yards long and 3 inches wide.

The dressings are contained in three covers: (1) Filter paper; (2) paraffin paper; (3) parchment paper (yellowish-brown colour). A label will be pasted along the junction of the outer cover, blue for the large, white for the medium, and red for the small-sized dressing. The label will have printed on it the contents of the package and their use, *i.e.*, for wounds of thorax, abdomen, pelvis and hip in the case of type A (large-sized dressing; for head, neck, shoulder, leg and thigh in the case of type B (medium-sized); and for the upper extremities, ankle and foot, in the case of type C (small-sized).

The charpie is carefully prepared and purified, and must be capable of absorbing thirteen times its own weight of water. The safety pins are nickel plated. The bandages must bear a strain of at least 52½ lb. (25 kilog.).

These prepared packages of dressings are to replace the packages of dressing material contained in the field medical and surgical equipment. The regimental equipment will be provided with them first, and then the ambulances, field hospitals, &c. W. G. M.

**New French Regulations affecting the various Lines of Communication and the Military Medical Service in the Field.** (*Rev. Mil. Suisse*, September, 1908.)—These regulations, dated March 5th, 1908 have just been published. They embody the greater part of the suggestions made by General Borgnis-Desbordes, regarding the organisation of lines of communication, and by General de Lecroix, regarding the field medical service. It is undoubtedly a fact, that these two branches of the military service, highly important though they are, do not attract public attention, and are therefore apt to be neglected. One reason is, that the lines of communication have no functions in time of peace, and another, that public attention is always concentrated on the fighting line. The humbler branches are forgotten in spite of the useful and often dangerous nature of their duties.

The new regulations for lines of communication comprise some changes in terms: thus, the "Directeur Général des chemins de fer et des étapes" becomes "Directeur de l'arrière;" the "têtes d'étapes de guerre" are to be called "gares de ravitaillement" &c., the "têtes d'étapes de route" become "gares origines d'étapes," &c.

The principle of automatically pushing a day's rations forward to the army corps is laid down in art. 148. Delivery of these rations has only to be taken by the army corps at the "gares de ravitaillement" appointed in general orders.

By making a further use of railways and their capabilities, it has been found possible to relieve the army corps of two of its four sections of administration columns, and part of the field hospitals and field bakeries.

Article 34 enumerates the various military units on the lines of communication, namely, the *convoi administratif* (composed of a number of sections varying according to the number of army corps composing the army:) *parc de bétail;* army bakery (composed similarly of a certain number of field bakeries with their convoys); field hospitals; clearing hospitals.

Auxiliary convoys are partially or totally replaced by automobiles. Article 187 gives full particulars for the organisation of these automobile convoys, which consist of heavy vehicles mobilised at certain points, and which are: (1) Vehicles for the transport of a daily ration and ammunition supply (these are grouped in convoys, made up of sections); (2) automobile omnibuses for transport of *personnel* and for evacuation of sick and wounded.

With regard to the new regulations for the military medical service, these have been rendered necessary by the experiences of the Manchurian campaign.

General de Lecroix, in his report, makes the following remarks:—

"It is apparent that a complete change should be made in the organisation of the service for the fighting line, in the composition and the number of medical units employed on the battlefield, and the grouping of the means of transport assigned to the medical service at the front.

"The conclusions which have been arrived at by the General Staff and by means of staff rides, and which are corroborated by the writings of a great number of medical officers, furnish valuable information as to the general functions of the service, both at the front and on the lines of communication. They show also the absolute necessity of organising medical reserves, and the almost insurmountable difficulties of applying some of the paragraphs in the old regulations, such as the replacing of ambulances, on the evening of or on the day after a fight, by field hospitals.

"Other points which require revision, on account of the friction which has been or will be inevitably caused, are the independence of the transport officers in dealing with medical officers in charge of units; and the multiplicity of letters and reports which have to be written by medical officers at critical moments of a campaign."

Regulations have, therefore, been drawn up with a view to doing away with these difficulties, and their efficiency is to be thoroughly tested during the present manœuvres, though it cannot be said that manœuvres supply as thorough a test as might be desired.

The conclusions of General de Lecroix's report as regards the testing of the proposed new regulations are worded as follows:—

"No amount of reasoning, however good, is so valuable as experiment, and I think the experiment can be made with comparative ease. It will be sufficient to mobilise complete medical units, to accompany one of the divisions of an army corps, that is to say, a divisional company of stretcher bearers, two or three field ambulances, and as many field hospitals. It will not be necessary to mobilise, under the principal medical officer, the medical units of the army corps, such as are distributed on the line of march, some with the ammunition column, and others with the supply park. It will be sufficient to have them represented by a medical officer who will act as senior medical officer of the units, and who will receive and give orders by means of which it will be easy to gain information as to the work of the various units, and the periods of time required to get them into work." W. G. M.

**Purification of Drinking Water for Troops in the Field.** (*Military Surgeon*, April, 1908.)—In an exhaustive article on this subject, Captain C. R. Darnall, after indicating in detail the various methods of purifying water for drinking purposes, such as by chemicals (bromine, chlorine, hydrochloric acid, potassium permanganate and ozone), by heat, by filtration, and by the addition of precipitating or coagulating agents, proceeds to describe at some length the filter which he has himself invented.

This, he says, is light, easily transportable, simple in construction, easy to operate and durable. The purification of the water is carried out first by precipitation (and for this alum and bicarbonate or carbonate of soda are used—5 grains of each to every gallon of water), and then by filtration through cloth. The whole apparatus consists of (1) a galvanised iron tank 24 inches high, with an oval section measuring 7 inches by 16 inches; (2) two cylindrical water-cans, 7 inches by 23 inches; (3) a filter consisting of metal framework connected to a syphon of ½ inch galvanised water-pipe. Over the cylindrical framework is fastened the filtering material, which consists of twenty-eight thicknesses of a closely-woven cotton material called "outing flannel." All the water passes through this to reach the syphon, and as it is sterilised daily bacteria cannot multiply in it. To start the syphon a small pump like a bicycle pump is used. The apparatus is so constructed that all parts may be packed in the large oval can, which is then placed in a light wooden crate; this crate is also used as a stand for the filter when in use.

Fifty-five gallons of water per hour can be obtained from this filter, and it weighs 35 lb. without the crate. A larger model, of a gross weight of 390 lb. and with a capacity of 400 gallons per hour, is also made.

One large filter or six small should be furnished to each regiment, and this would provide plenty of water both for the main body and detachments. W. G. M.

**Disposal of the Dead on Battlefields.** (*Arch. de Méd. et Phar. Mil.*, July, 1908.)—Méd.-Major Le Goic informs us that at the fourteenth International Congress of Hygiene attention was drawn to the difficulties connected with the burning of corpses of men and animals on the march and in permanent camps, and the impossibility of establishing furnaces for cremating purposes. An article has also been written showing that, despite the excellent results obtained from the Créteur[1] process, it is impossible permanently to adopt it, as cremation has not yet become a national custom. The armies of the principal European nations have only prescribed its use under exceptional circumstances. Their rules for the burial of corpses differ very little from the French regulations on the subject, though the French are probably slightly better.

The German regulations of 1907 are similar to the French in recommending the avoidance of the neighourhood of water, villages, roads, &c., in prescribing that the bodies should be buried at a depth of at least 1 metre below the surface, and that in case of emanations the trenches should be remade or even that the bodies be burnt. Such work is carried out by the Army Medical Corps. Lime is also to be used for covering the bodies, as a disinfectant.

The Italian regulations prescribe the use of trenches, each to contain an average of ten bodies, to be dug with the ordinary precautions, and recommend covering the bodies with lime if the trenches are not deep enough.

The Austro-Hungarian regulations say that a dry soil easily permeated by air should be sought, and that mounds be formed which should be sown with seed; damp pits should be drained and disinfectants used.

M. Matignon reports that during the Russo-Japanese War, after the battle of Mo-tien-ling in 1907, those bodies which had not been buried sufficiently deeply were burned by the Créteur process. The Japanese regulations prescribe the burning of bodies of their own soldiers, and the burial of those of the enemy, except in cases of epidemic, when all must be burnt. Cremation was carried out by placing ten or twelve naked bodies on faggots of wood supported by bricks, on these was placed another layer of faggots, and then of bodies, and so on. The whole was finally sprinkled with petroleum and set fire to. The Russians buried their bodies. After the battle of Mukden it was found that this had not been done deep enough and that the trenches contained too many corpses, for they were exposed and devoured by dogs.

The French regulations contain some recommendations on the subject of drainage. This has been brought to a state of perfection, if not for armies in the field, at least for those that are stationary or in a state of siege. The author proceeds to give details of a drainage system, and urges the value of this system associated with a supply of air, in preference to cremation, for the hygienic disposal of dead bodies.

The system of draining cemeteries, invented by M. Coupry, has met with a success which time, the author states, has proved to be thoroughly deserved. In 1890-91 a report appeared, published under the auspices of the municipality of St. Nazaire, on experiments carried out in the Avenir cemetery by MM. Brouardel, Ogier and du Mesnil, which were based upon the report of the Commission for the Improvement of Cemeteries, dated 1881, and which contained the following results: Four exhumations had been made; three of corpses from the new cemetery drained on the Coupry system, and one of a corpse from the old cemetery situated on damp clay soil. The first three had only been buried a year, but all the soft parts had disappeared; there was no smell, and live insects of the *Anthomysides* family were found on certain portions. In contrast to this, of the fourth corpse, which had been buried seven years, all the viscera remained, the heart was recognisable, and there was a smell. The conclusions of the report were to the effect that the rapid decomposition of the bodies from the new cemetery was due to the following causes:—

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[1] M. Louis Créteur was appointed by the Belgian Government to help in the disposal of the killed at Sedan and its neighbourhood, and published a pamphlet in 1871, "L'Hygiène sur les champs de bataille," advocating cremation as the only suitable means of disposing of dead bodies in war.

(1) They were exposed to the contact of the air circulating in the earth, and had not been buried in coffins which were made impermeable to air, or filled with antiseptic or other fluids.

(2) The earth was well aired by the drainage, and protected from subsoil water.

(3) The Coupry system dried the soil by permitting the air to penetrate it.

(4) The working of this system lessens the quantity of carbonic acid gas circulating in soil that is full of organic matter. It thus permits of ground being used for burial purposes which, till previously, had been considered unfit for such purposes.

In 1900 the author assisted at the exhumation, for purposes of comparison, of three bodies which had been buried for seven years in the old cemetery, and three from the new. In the case of those from the old, the coffins were found to be nearly intact, the bodies were covered with water, the heads being quite recognisable and the garments still in existence, while there was a smell. It was found with those from the new cemetery that no coffin remained and there was no smell, while even the bones were decaying.

These results were so remarkable that the author determined to collaborate with M. Coupry in elaborating a system of drainage for battlefields. In the course of the experiments that followed they found that there are two sorts of phenomena in the decomposition of a corpse—those which first take place and are of a chemical order, and those concerned with the production of insect life, which are physical. The experiments of Malvoz prove the truth of this theory. If the air is too dry (as, for instance, in the case of bodies abandoned in the desert), mummification ensues. In order that the microbes should do their work of consuming bodies, it is necessary that there should be a certain quantity of air, as without it their development cannot take place. Further, there must be a certain percentage of moisture, but if the ground is too wet bodies are in a state of adipocere, and therefore the chemical phenomena become preponderant, and stop the work of the microbes.

For these reasons it is apparent that on the field of battle burial pits well aired and drained are the best, and if the regulations of the French decree of 1892 were augmented by drainage, this would ensure the rapid disappearance of the bodies as innocuously as possible.

The author's proposal is to dig pits 10 metres long, 2 metres broad, and 2 metres deep, which could each hold seventy-five to one hundred bodies, lying four or five deep. They would hold such a number with ease if the following conditions were observed: Around the bottom of the pit a small channel, 30 cm. wide and 30 cm. deep, should be dug. In order to be effective, this channel should have an outlet, which can be made by prolonging it beyond the pit in a sort of drain consisting of a trench filled to a depth of 30 cm. to 40 cm., with branches and pebbles. This improvised drain should lead into a small soakage pit into which the water from the burial pit could drain, and there soak into the earth. It must be remembered that the most essential condition of quick decomposition is that the bodies should not be wet, for, as already stated, the agents which accomplish the work of destruction require air, while water prevents their development and destroys them. Bodies soaked with water become inflated and resist decay.

The bottom of the pit thus drained should be covered with branches and pebbles, or preferably with coarse sand, so that all water can drain away. Between each layer of bodies there should be a layer of branches, because it is absolutely necessary that there be plenty of air, in order to encourage the development and the migration from body to body of the decomposing agents. At the level of the second layer from the top of the bodies a true channel should be constructed of earth, wood or stones, which should lead in the direction opposite to that of the soakage pit above mentioned. This channel leads into a perpendicular shaft cut in the soil, that acts as a flue, on the top of which a large fire is kept burning to destroy the emanations coming from the pit, or it can be filled with charcoal or other absorbing substances, which will have the same effect as a fire.

It is the author's opinion that clothing should be removed from the bodies before burial; but, except in cases of advanced putrefaction, foully smelling corpses, or bodies of men who have died of infectious disease, he thinks it advisable to forbid the sprinkling of the bodies with quicklime, or at least to make only a moderate use of it, and only as a deodorizer, as the decomposing agents must be encouraged and not destroyed. The bottom of the pit, however, as well as its immediate neighbourhood and the drains and soakage pit can all be sprinkled with a certain amount of quicklime, in order to purify the water passing through them. Any other suitable disinfectant can be used for the same purpose, such as sulphates of iron and copper or phenol, but these must never be put on the bodies except in the above-mentioned cases. Charcoal can be put on the bodies, if broken up into small fragments, but it should not be used in a pulverised state.

On the top layer of bodies, before covering them over with earth, branches should be placed, on which should rest some of the garments of the dead. Peat, ashes, or other material capable of absorbing foul gases should be placed on the garments, and the whole covered with earth to a height of 1½ to 2 metres. The earth should be piled up to form a mound with sloping sides, so that rain may flow off without penetrating the pit. The inhabitants of the neighbourhood should be recommended to look after these pits and fill up any crevices which may form.

In conclusion, the author remarks that all these arrangements are based on the following principles:—

(1) Bodies should be protected from water if they are to decay quickly and hygienically.

(2) The bottom of the burial pit and its drain should be sprinkled with quicklime or other disinfectants.

(3) Foul gases cease to form when the decomposing agents are at work in large numbers and under favourable conditions. It is not necessary, therefore, to arrange for the destruction of gases except during the first hours of decomposition.

The author does not anticipate ready acceptance of his views, because of the time that will be required to make burial pits on his plan, but he asserts that once they are adopted, conditions similar to those which arose after the battle of Sedan will be entirely prevented. The infection of the ground will be avoided, and time will really be saved by digging one large pit instead of twelve, as in the old system, for the same number of bodies. His system would be of the greatest utility in times of siege or of epidemics. W. G. M.

**The German Regulations for a Dental Service in the Field**. (*Arch. de Méd. et Ph. Mil.*, August, 1908.)—The old field medical regulations of 1878 did not refer to a dental service in the field, but in the Boxer expedition and in the South-West African campaign a dental service had to be provided. Dentistry was carried on in Tientsin, in the military hospital, from June 10th, 1901, to September 30th, 1905, and a large amount of work was performed; thus in 1903-04, out of a strength of 2,776, 1,022 were treated, the cases including 672 extractions, 769 stoppings, and the provision of 20 dentures.

For some years past all the students in the Army Medical School have had to go through a course in dentistry, and, according to the field medical regulations of 1907, all the medical units are supplied with dental instruments. Further, a dentist will be attached to the clearing hospital detachment of each army corps.

The military dentists are graded as officers, and are recruited from the dental profession. Although attached to the clearing hospital detachment, they will be employed, on demand of divisional principal medical officers (or of regimental medical officers and officers in charge of field hospitals, in case of urgency), amongst the troops and units in the area of operations.
W. G. M.

**Report on the Sheep Disease known as "Blue Tongue."** By H. Watkins-Pitchford, F.R.C.V.S., F.R.S.E., Government Bacteriologist. (*Natal Agricultural Journal*, May to August, 1908.)—Blue tongue is a specific febrile disease of sheep, peculiar to South Africa. It is called by the Boers "blaau-tongue," or by the scientists "specific catarrhal fever." It varies in its intensity year by year, and it causes much loss to the sheep farmer, both by death and by loss of flesh and fleece. Its epidemiology may be summarised as follows:—

It begins towards the end of summer (in January), and is at its worst in February and March. Its appearance is hastened by a rainy spring followed by a wet summer. It declines as the cold of winter comes on. The localities it favours are the low-lying or marshy places, and the warmer valleys. In its etiology it is associated closely with horse sickness; it is not due to the same cause, as has been proved by inoculation experiments, but is due to the same agency, viz., insects.

The insect blamed is the mosquito, but apparently this conclusion has been arrived at by a process of exclusion, and not by actual experiment with individual species of mosquitoes.

The evidence adduced against the mosquito is: (1) Seasonal incidence; (2) conditions of weather, heat and moisture; (3) locality, low-lying or marshy ground; (4) infection is contracted in twilight or during the hours of darkness; (5) infection can be avoided by protection.

The two latter points have been conclusively proved by experiment by placing sheep in mosquito-proof pens between the hours of 3.30 p.m. to 10.30 a.m. The unprotected sheep (controls) contracted the disease, while the protected ones kept well during the period of the experiment (three months), even though infected sheep were placed alongside them in the pen. The beneficial effect of shedding and kraaling is attributed not only to the protection afforded by the walls of a closed shed, but also to the exhalations from a closely-packed herd in a confined space. Such an atmosphere is fatal to the mosquito. The protective effect of dipping with tar derivatives is also noted, and also the effect of shearing, which lessens protection. Old ground with long grass is dangerous, as it harbours mosquitoes.

As regards age, lambs are practically immune, but gradually lose their immunity after weaning. The sexes are equally affected. The breed is of some importance as regards immunity, for Kaffir sheep exhibit great, and some Persian sheep considerable, immunity. Other breeds show no promise of developing any immunity.

*Symptoms.*—With the common signs of sickness there is a ropy discharge from the nose, the muzzle is swollen, inflamed and sore; temperature 104° to 107° or 108° F., until exhaustion sets in, when the animal falls. The tongue is inflamed and raw at the tip; the gums, the inside of the cheeks, and the eyes are also inflamed. The sixth day is the critical period, when death may occur, or a slow, painful convalescence set in. The death-rate varies in different parts from 6 to 10 per cent. to 25 per cent.

*Post-mortem* appearances in addition to the above are to be particularly noticed in the heart, stomach, and intestines, which are the seats of small hæmorrhages occurring as petechiæ or as streaks. The inflammation spreads up the nasal mucous membrane to the frontal sinuses. The blood is apparently unaltered, and careful microscopy has not revealed any parasite. The serum of a sheep sick of the disease is virulent, and capable of producing the disease in another if injected hypodermically; the same serum after being passed through a porcelain filter (size not stated) is still virulent. Therefore the organism must be present in the blood, and is probably ultra-microscopic. The virus will live in bottles for ninety days, and reproduce the disease if injected, but the incubation period is prolonged.

The disease can be produced by intravenous injection, but though the incubation period is slightly shorter (three and one-sixteenth days) than the subcutaneous method (three and three-fifths days), the latter is more likely to produce a well-marked type of disease.

*Protection and Treatment.*—Immunity is obtained after an attack, but it lasts only for a year. A hyperimmune serum has been produced by the injection of the blood of sick sheep at frequent intervals into an animal recently recovered from blue tongue. This serum is protective for a period of three weeks to a month, and should be given in repeated doses of 25 cc. for this purpose. As a treatment it is of great value and immediately checks the disease. It has been used along with the virulent virus as a vaccine (4 cc. of hyperimmune serum + 2 cc. virus), but the results it gives are very irregular. By attenuating the virus (defibrinated blood) at a temperature varying from 112° to 117° F. for a period varying with the original virulence and with the degree of virulence required, one is able to use it as a vaccine. The point to be observed is that the vaccine must be so attenuated as to produce only a mild reaction; no object is to be gained by a severe reaction, seeing that naturally acquired immunity lasts only for a year. Good results have been obtained by this method, and of an experimental flock only the unvaccinated sheep contracted the disease, while the vaccinated escaped. Apparently a good deal more work yet remains to be done in the standardising of this vaccine, as in some cases its use has been followed by an attack as virulent and almost as fatal as the disease itself. The time recommended for inoculation is early in November.

J. C. K.

**Concerning the Treatment of Experimental Trypanosomiasis.** Part II. By Benjamin Moore, M. Nierenstein and J. L. Todd. (*Annals of Tropical Medicine and Parasitology*, vol. ii., No. 4, 1908.)—These experiments have been carried out with a strain of *Trypanosoma brucei*, which killed untreated rats in three to five or seven days. The technique is fully described, and the precautions to be taken in preserving the strain from any acquired immunity to drugs. It is insisted that no treatment be begun until the constant presence of the parasite in the peripheral blood is well established, firstly, because of the practical impossibility of treating a naturally infected animal in the very early stages, and secondly, in order that the suspected developmental resistant forms may have time to be produced. It is suspected that recurrences are due to the development of resistant forms.

The experiments narrated in Part I. are completed with the result that the rats treated by atoxyl followed by bichloride of mercury and by atoxyl followed by Donovan's solution never had recurrences, though they were not immune to reinoculation, while those treated by atoxyl alone eventually died of trypanosomiasis. The following drugs were found inefficacious: Quinine, cinchonine, cupreine, quinine-cacodylate, quinine-cacodylate followed by sublimate, quinine-cacodylate followed by iron cacodylate, quinine-cacodylate followed by iron chloride, arrhenal, potassium bichromate.

None of the aniline colouring matters were found to be of much value; it is suggested that an active trypanocidal radicle in such substances is the $NH_2$ group, which is termed a "trypanophobe" group. This conclusion was arrived at by starting with an indifferent organic compound (phenophthaleine) which contains no $NH_2$ groups, and working up through fluorescein, eosin, floxin, &c., until rhodamine was reached; this substance was found to have a very distinct effect on the parasite, and it possesses $NH_2$ groups. For dogs, guinea-pigs, and mice the comparative value of acetylated atoxyl followed by bichloride of mercury, of acetylated atoxyl, and of atoxyl, is as the order in which they are named; but no preparation can definitely cure. For rabbits, atoxyl followed by bichloride of mercury is much superior to atoxyl alone; the latter is also effective in the treatment of rabbits infected with *Trypanosoma gambiense*. For donkeys, atoxyl and mercury combined are distinctly superior to atoxyl alone, but neither cures. For rats, trypanroth followed by bichloride of mercury is superior to trypanroth alone, but inferior to the combined treatment by atoxyl and bichloride of mercury.

The interesting fact is brought out that though trypanosomes may not be found in the blood of an experimental animal, yet on subinoculation that blood may be proved to be infective, even though parasites were not seen in the animal from which the blood was taken for over a month, both before and after the subinoculation, and even though large doses of atoxyl, or of atoxyl and mercury, had been given to the infecting animal only a day previously.

Blood taken during a rise in temperature would appear to be no more infective than when the temperature was no higher than usual. During the customary *ante-mortem* fall of temperature the blood has been infective, though no trypanosomes were found. In these successful subinoculations the incubation period was much lengthened, but the course of the disease, once the parasites appeared in the blood, was normal. In six out of thirteen subinoculations the incubation period was over fifteen days; in three over twenty, the longest was twenty-six days, and the shortest four days, in which case the blood was taken from a dying animal.

"Although other explanations suggest themselves, these observations seem to be in harmony with our belief that recurrences in apparently cured trypanosome-infected animals are due to the production and persistence of some resistant developmental form of the parasite, and not merely to the acquirement of 'phenotherapeutic resistant' properties by it."

J. C. K.

# Correspondence.

## WHITE ANTS AS A DELICACY.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—Whilst big-game shooting last year at the foot of the Nilgiri Hills, South India, I came upon numerous small pits covered with brushwood, the more recent ones having a layer of mud over the supporting brushwood. A small hole was left in the middle, underneath which was placed a large *chattie* or earthenware jar. On asking my shikari what these pits were for, he informed me that they were used to catch white ants, which the natives considered a great delicacy. The pits were about 3 feet by 3 feet, covered with mud on a brushwood support, in the centre of which was left a small hole, underneath which was placed an earthenware jar.

The white ants, which love darkness and dead wood, find their way into the pits, many, however, falling into the *chatties* in their endeavours to do so.

The people at the foot of these hills are closely related to the Todas, the aborigines of India, who inhabit the surrounding hills to a certain extent.

Other tribes in the South of India eat white ants also, the popular idea being that they act as a tonic. They are eaten raw and alive, or roasted.

I am, &c.,

*Station Hospital, Secunderabad,*
*Deccan.*

J. H. DOUGLAS,
*Captain, R.A.M.C.*

## ENTERIC INCIDENCE IN INDIA AND ITS LESSONS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—The November number of the Journal contains a paper by Lieutenant-Colonel G. S. Thomson, which appears to be deserving of sympathetic consideration. One is tempted to call especial attention to it, as a perusal of the discussion, reported as having followed the reading of this paper before the United Services Medical Society, suggests that his critics and hearers failed to appreciate the need of a wider view being taken as to the possible factors concerned in the etiology of enterica than is presented by a contemplation of the life-history of a specific germ.

In submitting these remarks, I do not imply that I accept as satisfactory either the facts or theories put forward by Colonel Thomson, neither do I question the etiological significance of the *Bacillus typhosus* ; but I do plead for an intelligent and systematic attempt to solve some of the mysteries associated with the metabolic changes in that living body which is the only *soil* in which the specific germ can apparently produce the clinical phenomena which we call enteric fever. Colonel Thomson directs our attention to one particular and possible disturbing factor in the condition of that human soil: that is, he lays stress on dietetic variations, and significantly hints that a luxus consumption of proteins may be a dominant variant. This is no new idea, but so far as my reading goes this paper of Colonel Thomson's is the first in which it has been seriously advanced.

Eight years ago, in my annual report as Sanitary Officer of the Rawal Pindi District for the year 1899-1900, I referred to certain enquiries I had been making as to the possible existence of an antecedent condition of excessive intestinal putrefaction in the persons of those contracting enterica, which condition I thought might or might not be a complementary or determining factor in typhoid infection. As an index of this condition, I took the ratio between the total and conjugated or aromatic sulphates in the urine. The conjugated sulphates are the products of the breaking down of amino acids derived from the splitting up of protein molecules. Under normal conditions of metabolism, my observations showed the ratio of the aromatic to the total sulphates to be approximately as one is to nine, while under circumstances of gross feeding, more especially excessive protein intake, the ratio was one to five, or even one to four in extreme cases. Only a limited number of observations was made, but the significant fact was elicited that a high conjugated sulphate ratio was almost invariably a precursor to fever, and in two out of the ten cases observed this fever was declared ultimately to be enterica. The series of observations was too small from which to generalise, but I suggested at the time that it was a line of enquiry worth following up. Except in that annual report, which was printed by the Government of India, my ideas were never published, but officers who attended my lectures at Netley and at the College in London will recall that I referred to this aspect of the question as a field too much neglected, as it is clear that few are able to get out of the narrow bacillary work in enteric etiology. Similarly, in view of the apparent elective affinity of the enteric germ for bile salts, it would be interesting to know whether there is any relation between hepatic activity and enteric incidence.

The appearance of Colonel Thomson's paper tempts me to refer to the conception of enterica which many fail to grasp, that without a suitable soil in which to grow the causative bacillus is non-pathogenic. Is it not time to break away and try new lines of enquiry? and among the first to be followed I suggest that of metabolism as a possible predisposing cause of enteric incidence. It is obvious that such an inquiry will entail much labour and application, but it will not be wasted if it do but tell us how far the altered climatic conditions and more liberal regimen of the Tropics affect the metabolic normals of the European soldier. On these points we are absolutely ignorant at present.

I am, &c.,

R. H. Firth,

*November* 11*th*, 1908. *Lieutenant-Colonel, R.A.M.C.*

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

Sir,—With reference to my remarks on "Enteric in West Africa" (p. 504 of the November number of the Journal), I write to say that they have been wrongly reported. What I actually said was as follows: "In West Africa, in my opinion, the British troops consume more proteid than in India. I have had the opportunity of serving in both countries, and my experience is that the men are much hungrier, and more inclined to consume large quantities of food, in West Africa than in India.

"During 1905 no cases of enteric occurred amongst the garrison, and during this period the strength of the European troops was about 150."

I am, &c.,

H. W. Grattan,

*Major, R.A.M.C.*

*Royal Army Medical College,*
*Millbank, November* 11*th* 1908.

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## REMOVED FROM THE CORPS AND STILL ON THE ACTIVE LIST,

## OFFICERS OF THE ROYAL ARMY MEDICAL CORPS

AND

## RE-EMPLOYED RETIRED OFFICERS.

JULY, 1908.

[*This List is prepared according to the latest information contained in Official Returns. Officers are requested to register any Diplomas or special qualifications at Headquarters, War Office, in order that this list may be published as complete as possible.*

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b = Diploma in Public Health.
c = Bacteriology.
d = Dental Surgery.
e = Dermatology and Venereal Diseases.
f = Specific Fevers.
g = Laryngology.
h = Midwifery and Gynæcology.
j = Operative Surgery.
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| Lieutenant-Colonel | Irwin, J. M., M.B. | Assistant Director-General. |
| ,, ,, | Tate, A. E. | Deputy Assistant Director-General. |
| Major | Thurston, H. C., C.M.G. | ,, ,, ,, ,, |
| ,, | Buist, H. J. M., D.S.O., M.B. | ,, ,, ,, ,, |
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|---|---|---|
| Colonel | Bruce, Sir D., Knt., C.B., F.R.S., M.B. | Expert in Tropical Diseases. |
| Lieutenant-Colonel | Melville, C. H., M.B. | Expert in Sanitation and Secretary. |

## ROYAL ARMY MEDICAL COLLEGE.

| Rank. | Name. | Appointment. |
|---|---|---|
| Colonel | Wardrop, D., M.B. | Commandant and Director of Studies. |
| Major | Spencer, C. G., M.B., F.R.C.S. Eng. | Professor of Military Surgery. |
| Lieutenant-Colonel | Simpson, R. J. S., C.M.G., M.B. | ,, Tropical Medicine. |
| ,, ,, | Davies, A. M. | ,, Hygiene. |
| Major (Brevet-Lieutenant-Colonel) | Leishman, W. B., M.B. | ,, Pathology. |
| Captain | Wanhill, C. F. | Assistant Professor of Hygiene. |
| Major | Harrison, W. S., M.B. | ,, ,, Pathology. |
| Lt.-Colonel (Bt.-Col.) | Lambkin, F. J. | Lecturer in Syphilology. |

## SURGEON-GENERALS.

| Name. | Station. | Appointment. |
|---|---|---|
| Bourke, G. D., C.B., | Dublin | Principal Med. Officer, Irish Command. |
| Donovan, W., C.B. | Pretoria | ,, ,, ,, South Africa. |
| Dorman, J. C., C.M.G., M.B. | London | ,, ,, ,, Eastern Command, England. |
| Gallwey, Sir T. J., K.C.M.G., C.B., M.D. | Aldershot | Principal Med. Officer, Aldershot Command. |
| Gubbins, W. L., C.B., M.B., M.V.O. | War Office, London | Headquarter Staff. |
| Pratt, W. S., M.B., C.B. | Salisbury | Principal Med. Officer, Southern Command. |
| Slaughter, W. B. | Lucknow, India | ,, ,, ,, 8th (Lucknow) Division. |
| Sloggett, A. T., C.M.G. | London | ,, ,, ,, London District. |
| Trevor, F. W., C.B., M.B. | Simla, India | ,, ,, ,, His Majesty's Forces in India. |

## COLONELS.

| Name. | Station | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Anderson, L. E. | Allahabad, India | Principal Medical Officer Allahabad and Fyzabad Brigades | — |
| Barrow, H. J. W. | Dalhousie, India | Prin. Med. Offi , 3rd (Lahore) Div. | — |
| Babtie, W., V.C., C.M.G., M.B. | London | Inspector of Medical Services | — |
| Bruce, Sir D., Knt., C.B., F.R.S., M.B. | London | Expert in Tropical Diseases, Army Medical Service Advisory Board | — |
| Corker, T. M., M.D. | Edinburgh | Prin. Med. Officer, Scottish Com. | — |
| Croly, A. E. J., F.R.C.S.I. | Dover | Admin. Med. Officer, Dover | — |
| Ellis, P. M. | Quetta, India | Principal Medical Officer, 4th Quetta Division | — |
| Forman, R. H., M.B. | Bombay, India | Principal Medical Officer, Bombay Brigade | — |
| Goggin, G. T. | Chester | Prin. Med. Offi., Western Com. | — |
| Harwood, J. G., F.R.C.S. Edin. | Calcutta, India | Principal Medical Officer, Presidency and Assam Brigades | — |
| Jones, J. M. | Cairo | Principal Medical Officer, and Offi. Com. R.A.M.C. in Egypt | — |
| Kenny, W. W., M.B., F.R.C.S.I. | Pretoria | Administrative Medical Officer, Transvaal, O.R.C. and Natal | — |
| Kerin, M. W. | Tidworth | Administrative Medical Officer | — |
| LaVettee de la Dubeterre Morris, J. J., M.D. | Portsmouth | Admin Med. Officer, Portsmouth | — |
| Lloyd, O. E. P., V.C. | Bareilly, India | Principal Medical Officer, Bareilly and Garhwal Brigades | — |
| MacNeece, J. G. | Malta | Prin. Med. Officer, Malta Com. | — |
| MacNeece, T. F. | Chatham | Admin. Med. Offi., Thames and Medway | — |
| Maclean, F. B. | Aden | Prin. Med. Officer, Aden Brigade | — |
| Murray, H. W., M.B. | Gibraltar | Principal Medical Officer | — |
| North, E., F.R.C.S.Edin. | Dublin | Admin. Med. Officer, Dublin Dist. | — |
| O'Connor, A. P., C.B., F.R.C.S.I. | York | Prin. Med. Officer, Northern Com. | — |
| O'Sullivan, D., F.R.C.S.I. | Jubbulpore, India | Prin. Med. Officer, Jubbulpore and Jhansi Brigades | — |
| Peterkin, A., M.B. | Cape Colony | Administrative Medical Officer | — |
| Rainsford, W. J. R., C.I.E., F.R.C.S.I. | Devonport | Administrative Medical Officer, Devonport Dist. | — |
| Robinson, G. W. | S. Africa | .. .. .. .. .. | — |
| Todd, O., M.B. | Bangalore, India | Principal Med. Officer, Bangalore and Southern Brigades | — |
| Whitehead, H. R., F.R.C.S.Eng. | Peshawar, India | Prin. Med. Officer, 1st Division | b |
| Webb, C. A. | Cork | Admin. Med. Officer, Cork | b. |
| Wardrop, D., M.B. | R.A.M. College | Com. and Director of Studies | — |

## LIEUTENANT-COLONELS.

*(Under Article 365 of the Royal Warrant.)*

| | | | |
|---|---|---|---|
| Bedford, W. G. A., C.M.G., M.B. | Cosham | Officer in charge Mil. Hosp. and Command. 6th Coy. R.A.M.C. | — |
| Baker, W. J. | Cairo, Egypt | Officer in charge Military Hospital, and Officer Commanding 33rd Coy. R.A.M.C. | — |
| Butt, E., F.R.C.S.I. | Dublin | Medical Inspector of Recruits, Irish Command | — |
| Battersby, J., M.B., F.R.C.S.I. | Secunderabad, India | Officer in charge Military Hospital | — |
| Birrell, W. G., M.B. | Mauritius | Senior Medical Officer | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Barratt, H. J. | Shorncliffe | Officer in charge Military Hospital | b. |
| Burton, F. H. M., M.D. | Standerton, S. Africa | ,, ,, ,, ,, | — |
| Coates, G. J., M.D. | Cork | Officer in charge Military Hospital and Officer Command 16th Coy. R.A.M.C. | — |
| Culling, J. C. | Prospect, Bermuda | Senior Med. Officer and Officer in charge Mil. Hosp. and Officer Command 25th Coy. R.A.M.C. | — |
| Dodd, J. R., M.B., F.R.C.S.Eng. | Belfast | Administrative Medical Officer | b |
| Daly, F. A. B., C.B., M.B. F.R.C.S.I. | Curragh | Officer in charge Mil. Hosp. and Command 17th Coy. R.A.M.C. | — |
| Davies, A. M. | R.A.M. College, London | Professor of Hygiene | b. |
| Dick, W., M.B., F.R.C.S. Edin. | Woolwich | Admin. Med. Officer and Officer in charge Royal Herbert Hosp. | b. |
| Ford, R. W., D.S.O. | Gibraltar | Officer in charge Military Hospital | — |
| Hodson, R. D. | London | Recruiting London District | — |
| Heffernan, W. | Wynberg, S. Africa | Leave | — |
| Hathaway, H. G. | Devonport | Officer in charge Military Hospital and Officer Command 7th Coy. R.A.M.C. | — |
| Hackett, R. I. D., M.D. | Bordon | Admin. Med. Offi., Bordon Dist. | — |
| Irwin, J. M., M.B. | War Office, London | Headquarter Staff | — |
| Jennings, R., M.D. | Valetta, Malta | Officer in charge Military Hospital | — |
| Johnston, H. H., C.B., M.D. | Fort Canning, S. Setts. | Senior Medical Officer S. Setts. | b. |
| Jencken, F. J., M.B. | Meerut, India | Officer in charge Military Hospital | b. |
| Kay, A. G., M.B. | Netley | ,, ,, D Block, Royal Victoria Hospital | — |
| Lucas, T. J. R., C.B., M.B. | Bangalore, India | | — |
| Lambkin, F. J. (Bt.-Col.) | Rochester Row, London | Officer in charge Military Hospital | — |
| Maunsell, E. L. | Colchester | ,, ,, ,, ,, | — |
| Mosse, C. G. D., F.R.C.S.I. | Jamaica | Senior Medical Officer and Commanding R.A.M.C., Jamaica | — |
| Moberley, H. J. R. | Maymyo, India | Officer in charge Military Hospital | — |
| Macpherson, W. G., C.M.G., M.B. | War Office, London | Headquarter Staff | b. |
| Morse, R. E. R. | Lucknow, India | Officer in charge Military Hospital | |
| Noding, T. E. | Harrismith, South Africa | ,, ,, ,, ,, | — |
| Nichols, F. P., M.B. | Peshawar, India | ,, ,, ,, ,, | — |
| Nichol, C. E., D.S.O., M.B. | Aldershot | Com. R.A.M.C. School of Instruction, Offi. Com. Depôt R.A.M.C. and Officer in charge records | — |
| O'Keefe, M. W., M.D. | Rawalpindi, India | Officer in charge Military Hospital | — |
| O'Donnell, T. J., D.S.O. | Quetta, India | ,, ,, ,, ,, | — |
| Porter, R., M.B. | Belfast | Officer in charge Mil. Hosp. and Command. 15th Coy. R.A.M.C. | — |
| Pike, W. W., D.S.O., F.R.C.S.I. | Darjeeling, India | Officer in charge Military Hospital | — |
| Robinson, S. C. B. | Ahmednagar, India | ,, ,, ,, ,, | — |
| Rhodes, J. H. A. | Cottonera, Malta | ,, ,, ,, ,, | — |
| Rowney, W., M.D. | Aldershot | ,, ,, Connaught ,, | — |
| Rose, A. S., M.D. | Cawnpore, India | ,, ,, Military ,, | — |
| Risk, E. J. E. | Bloemfontein | Officer in charge Military Hospital and Officer Commanding 24th Coy. R.A.M.C. | — |
| Reade, W. L. | Dublin | Officer in charge Royal Infirmary and Officer Commanding 14th Coy. R.A.M.C. | — |
| Russell, A. F., C.M.G., M.B. | London | Medical Inspector of Recruits, Eastern Command | — |
| Sawyer, R. H. S., M.B. F.R.C.S.I. | Pretoria, South Africa | Officer in charge Military Hospital and 23rd Coy. R.A.M.C. | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Skinner, B. M., M.V.O. .. | Sialkot, India .. .. | Officer in charge Military Hospital | — |
| Townsend, S., M.D. .. | Dover .. .. .. | Officer in charge Mil. Hosp., and Command. 11th Coy. R.A.M.C. | — |
| Treherne, F. H., F.R.C.S. Edin. | Ambala, India .. .. | Officer in charge Military Hospital | b. |
| Trevor, H. O. .. .. | Aldershot .. .. .. | Medical Inspector Recruits .. | — |
| Woodhouse, T. P... .. | Kasauli, India .. .. | Officer in charge Military and Cantonmt. Hosp. and Civil Surgeon | — |
| Westcott, S., C.M.G. .. | Mhow, India .. .. | Officer in charge Military Hospital | h. |

## LIEUTENANT-COLONELS.

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Adams, G. G. . .. | Salisbury .. .. .. | Medical Inspector of Recruits, Southern Command | — |
| Allen, S. G. .. .. | London .. .. . | Sick leave .. .. .. .. | b. |
| Adamson, H. M., M.B. .. | Ranikhet, India .. .. | Officer in charge Military Hospital | — |
| Aldridge, A. R., M.B. .. | Simla, India .. .. | Leave .. .. .. .. | b. |
| Austin, H. W. .. .. | Glasgow .. .. .. | Officer in charge Military Hospital | — |
| Battersby, H. L. .. .. | Hounslow .. .. .. | Officer in charge Military Hospital and Recruiting | — |
| Brazier-Creagh, G. W., C.M.G. | Lichfield .. .. .. | Officer in charge Military Hospital | — |
| Bond, R. P. .. .. | Chatham .. .. .. | Officer in charge Military Hospital and Officer Commanding 10th Coy. R.A.M.C. | — |
| Braddell, M. O'D., M.B. | Golden Hill .. .. | Officer in charge Military Hospital | — |
| Beevor, W. C., M.B., C.M.G. | Dalhousie, India .. .. | ,, ,, ,, ,, | |
| Birt, C. .. .. .. .. | Millbank, London . | Clinical Pathologist .. .. | — |
| Berryman, W. E... .. | Muttra, India .. .. | Officer in charge Military Hospital | — |
| Blackwell, C. T., M.D. .. | Belgaum, India .. .. | ,, ,, ,, ,, | b. |
| Buchanan, J. B. W., M.B. | Londonderry .. .. | ,, ,, ,, ,, | — |
| Brown, H. H., M.B. .. | Nowshera, India .. .. | ,, ,, ,, ,, | — |
| Burtchaell, C. H., M.B... | Dublin .. .. . | Staff Officer to Principal Medical Officer, Irish Command | b. |
| Barefoot, G. H. .. .. | Dinapore, India .. .. | Officer in charge Military Hospital | — |
| Bate, A. L. F. .. .. | Nowgong, India .. .. | ,, ,, ,, ,, | — |
| Carmichael, J., F.R.C.S.I. | Jullundur, India .. .. | ,, ,, ,, ,, | — |
| Caldwell, R., F.R.C.S.Eng. | Devonport .. .. .. | Sanitary Officer, Western Area, Southern Command | b. |
| Cree, G. .. .. .. .. | Madras, India .. .. | Officer in charge Military Hospital and in charge H.E. the Governor's Body Guard | — |
| Curtis, J. H. .. .. | Ballincollig .. .. | Officer in charge Military Hospital | — |
| Carr, H., M.D. .. .. | Nasirabad, India .. .. | ,, ,, ,, ,, | — |
| Cree, H. E. .. .. | Guildford .. .. .. .. | ,, ,, ,, ,, | — |
| Cocks, H., M.B. .. .. | Wellington, India .. | ,, ,, ,, ,, | — |
| Clarkson, T. H. F. .. | Tower of London.. .. | ,, ,, ,, ,, | — |
| Cottell, R. J. C. .. .. | Royal Hospital, Chelsea.. | Deputy Surgeon .. .. .. | h. |
| Dodd, A. .. .. .. | Chester .. .. .. | Officer in charge Military Hospital | — |
| Donnet, J. J. C. .. .. | Saugor, India .. .. | ,, ,, ,, ,, | — |
| Duncan, S. E. .. .. | Birmingham .. .. | Offi. in ch. Troops and Recruiting | — |
| Day, W. B., M.B. .. | Crownhill, Devonport .. | ,, ,, ,, .. .. .. | — |
| Daly, J. H. .. .. | Crete .. .. .. | Officer in charge Military Hospital | — |
| Daly, T. .. .. .. | Ferozepore, India .. | ,, ,, ,, ,, | — |
| Davidson, J. S., M.B. .. | Royal Herbert Hospital, Woolwich | Registrar and Secretary and O C. 12th and 34th Coys. R.A.M.C. | — |
| Donegan, J. F. .. .. | Khartoum, Egypt .. | Officer in charge Military Hospital | — |
| Donaldson, J. .. .. | Naini Tal, India .. .. | Officer in charge Military Hospital, Staff-Surgeon | — |
| Elkington, H. P. G. .. | Mhow, India .. .. | Divisional Sanitary Officer .. | b. |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Eckersley, E., M.B. | London | Recruiting, London District | b. |
| Firth, R. H., F.R.C.S. Eng. | Aldershot | In charge School of Army Sanitation and Instructor R.A.M.C. School of Instruction | b. |
| Faunce, C. E. | Tidworth | Officer in charge Mil. Hosp. and Offi. Com. 20th Coy. R.A.M.C. | — |
| Freyer, S. F., C.M.G. | Secunderabad, India | .. | — |
| Forrest, J. R. | Lahore Canton., India | Sanitary Officer 3rd Division | b. |
| Fletcher, H. J., M.B. | Shoeburyness | Officer in charge Mil. and Mil. Families' Hosp. and Recruiting | — |
| Ferguson, N. C., C.M.G., M.B. | Middelburg, Cape Colony | Officer in charge Military Hospital | b. |
| Fallon, J. | Aden | ,, ,, ,, ,, | — |
| Fayrer, Sir J., Bt., M.D., F.R.C.S.Edin. | Duke of York's School | Officer in Medical Charge | — |
| Gibson, J., M.B. | Limerick | Officer in charge Military Hospital | — |
| Geddes, R. J., D.S.O., M.B. | Woking | ,, ,, ,, ,, | b. |
| Gubbin, G. F. | Colaba, India | ,, ,, ,, ,, | — |
| Green, J. S., M.B. | Hyderabad, India | ,, ,, ,, ,, | — |
| Gordon, P. C. H. | Rangoon, India | ,, ,, ,, ,, | b. |
| Gordon-Hall, F. W. G., M.B. | Landour, India | ,, ,, ,, ,, | — |
| Gerrard, J. J., M.B. | Forrest, Malta | ,, ,, ,, ,, | — |
| Hamilton, T. W. O. H., C.M.G., M.B. | Aldershot | Staff Officer to P.M.O., A. C. | — |
| Heuston, F. S., C.M.G., F.R.C.S.I. | Dublin | .. | — |
| Hunter, G. D., D.S.O. (Colonel, Egypt) | Egypt | Principal Medical Officer Egyptian Army | - |
| Henderson, R. S. F., M.B. | India | .. | — |
| Haines, H. A., M.D. | Fyzabad, India | Officer in charge Military Hospital | — |
| Hale, G. E., D.S.O. | Murree, India | Leave | — |
| Hickson, S., M.B. | Cape Town, S. Africa | .. | — |
| Hearn, M. L. | Tientsin, North China | Sen. Med. Offi. and O.C. R.A.M.C. | — |
| Hall, R. H., M.D. | London | Recruiting, London District | — |
| Hanley, R G., M.B. | Dublin | Officer in charge Military Hospital, Portobello | |
| Hennessy, D., M.D. | Deolali, India | Officer in charge Military Hospital | — |
| Holyoake, R. | Dagshai, India | ,, ,, ,, ,, | - |
| Johnson, C. W., M.B. | Sheerness | ,, ,, ,, ,, | — |
| Jones, F. W. C., M.B. | Kamptee, India | ,, ,, ,, ,, | — |
| Josling, C. L. | London | Recruiting, London District | — |
| Kirkpatrick, R., C.M.G., M.D. | Chester | Medical Inspector of Recruits, Western Command | — |
| Kennedy, A. | Pachmari, India | Officer in charge Military and Cantonment Hospital | — |
| Knaggs, H. T., M.D. | Dublin | .. | b. |
| Lynden-Bell, E. H. L., M.B. | Allahabad, India | Officer in charge Military Hospital | — |
| Lilly, A. T. I. | Canterbury | ,, ,, ,, ,, | — |
| Lane, C. A., M.B. | Colombo, Ceylon | Senior Medical Offi. and Offi. Com. 26th Coy. R.A.M.C., and in charge Military Hospital | — |
| Lavie, T. G. | Meiktila, India | Officer in charge Military Hospital | — |
| Le Quesne, F. S., V.C. | Allahabad, India | .. | — |
| McCreery, B. T., M.B., F.R.C.S.I. | Shahjahanpur, India | Officer in charge Military and Cantonment Hospital | b. |
| Magrath, C. W. S., M.D. | Hilsea | Officer in charge Military Hospital | — |
| Morris, W. A. | Edinburgh | Offi. in charge Mil. Hosp. and Offi. Com. 13th Coy. R.A.M.C. | — |
| McGill, H. S. | Poona, India | Officer in charge Military Hospital | b. p. |
| Moore, R. R. H., M.D. | Netley | In charge Medical Division | — |
| Maher, J. | Potchefstroom, S. Africa | Officer in charge Military Hospital | — |
| Manders, N. | Preston | ,, ,, ,, ,, | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Meek, J., M.D. | Simla, India | Officiating Sanitary Officer, Army Headquarters | b. |
| Morris, A. E., M.D. | Jubbulpore, India | Officer in charge Military Hospital | — |
| Macleod, R. L. R., M.B. | Karachi, India | ,, ,, ,, ,, | b. |
| Melville, C. H., M.B. | London | Expert in Sanitation, Army Medical Service Advisory Board | b. |
| MacDonald, C. J., M.D. | Fermoy | Officer in charge Military Hospital | — |
| Mathias, H. B., D.S.O. | Simla, India | Secretary to Principal Medical Officer, India | — |
| Marks, G. F. H., M.D. | Calcutta, India | | — |
| Nash, L. T. M. | Barrackpore, India | Officer in charge Military Hospital | — |
| Newland, F. R., M.B. | Rawalpindi, India | | — |
| O'Connell, D. V., M.D. | Woolwich | Officer in charge Auxiliary Hosp. and Garrison Sanitary Officer | b. |
| O'Halloran, M., M.D. | Pretoria | Staff Officer to Principal Medical Officer, South Africa | — |
| O'Donnell, J. J., M.B. | Kirkee, India | Officer in charge Military Hospital | — |
| O'Callaghan, D. M. | Rawalpindi, India | Leave | — |
| Powell, S., M.D. | Aldershot | Officer in charge Isolation Hospital | — |
| Philson, S. C. | Roorkee, India | ,, ,, Military Hospital | — |
| Penton, R. H., D.S.O. | York | Medical Inspector of Recruits, Northern Command | — |
| Reid, J. M., M.D. | Victoria, S. China | Offi. in charge Mil. Hosp., and Offi. Com. 27th Coy. R.A.M.C. | — |
| Russell, M. W. | London | | — |
| Reilly, C. C. | Sandhurst | Surgeon R.M. College | — |
| Rowan, H. D., M.B. | Lahore Cantmnt., India | Officer in charge Military Hospital | — |
| Russell, J. J., M.B. | Rawalpindi, India | | — |
| Swabey, L. W. | Sitapur, India | Officer in charge Military Hospital | — |
| Simpson, R. J. S., C.M.G., M.B. | R.A.M. College, London | Professor of Tropical Medicine | — |
| Stuart, J. R., M.B. | Neemuch, India | Officer in charge Military Hospital | — |
| Sloggett, H. M. | Valetta, Malta | | — |
| Swan, W. T., M.B. | Chakrata, India | Officer in charge Military Hospital | — |
| Shine, J. M. F., M.D. | Jhansi, India | ,, ,, ,, ,, | — |
| Sparkes, C. S. | Deepcut and Blackdown | ,, ,, Detention Hosp. | — |
| Sexton, M. J., M.D. | Agra, India | ,, ,, Military Hospital | — |
| Starr, W. H. | Bangalore, India | | — |
| Sutton, A. A., D.S.O. | Woolwich | Officer in charge Medical Division | — |
| Salvage, J. V., M.D. | London | Sanitary Officer, Area south of Thames | b. |
| Saunders, D. M., M.D. | Dublin | Sanitary Officer, Dublin and Belfast Districts | b. |
| Tyrrell, C. R. | London | Staff Officer to Principal Medical Officer, Eastern Command | — |
| Thomson, W. B. | Calcutta, India | Officer in charge Military Hospital | — |
| Tate, A. E. | War Office London | Headquarter Staff | — |
| Thompson, H. N., D.S.O., M.B. | Aldershot | Officer in charge Cambridge Hosp. | — |
| Turner, W. | York | Offi. in charge Mil. Hosp. and Offi. Com. 8th Coy. R.A.M.C. | — |
| White, H. L. E. | Woolwich | Recruiting Duties | — |
| Weston, G. E. | Prospect, Bermuda | | — |
| Wyatt, H. J., F.R.C.S.I. | Dublin | Officer in charge Military Hospital, Arbour Hill | - |
| Wilson, G., M.B. | Multan, India | Officer in charge Military Hospital | — |
| Winter, T. B. | Bareilly, India | ,, ,, ,, ,, | b. |
| Wills, S. R. | Holywood | ,, ,, ,, ,, | — |
| Wilson, J. B., M.D. | Alexandria, Egypt | ,, ,, ,, ,, | — |
| Will, J., M.B. | Uganda | | — |
| Wright, R. W. | Woolwich | Sen. Med. Offi. Royal Arsenal | — |
| Windle, R. J., M.B. | Royal Hospital, Kilmainham, Dublin | Physician and Surgeon | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Whaite, T. Du B., M.B. | Gibraltar |  | — |
| Yourdi, J. R., M.B. | Fort Regent, Jersey | Offi. in charge Mil. Hosp. & S.M.O. | — |
| Yarr, M. T., F.R.C.S.I. | Poona, India | ,, ,, No. 1 Sect. Hosp. | k. |

## MAJORS.

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Austin, J. H. E. | Hounslow |  | — |
| Anderson, E. C., D.S.O. | Shorncliffe |  | — |
| Alexander, J. D., M.B. | Cahir | Officer in charge Military Hospital | — |
| Austin, R. F. E. | Chatham | Acting Company Officer | — |
| Anderson, J. B. | Bareilly, India | Leave | c. |
| Archer, S. A. | Devonport | Ophthalmologist | k. |
| Burnside, E. A. | Multan, India |  | — |
| Browne, E. G. | Dublin |  | b. |
| Bullen, J. W., M.D. | Mullingar | Officer in charge Military Hospital | b. |
| Blenkinsop, A. P. | Simla, India | Special Duty Army Headquarters | — |
| Beach, T. B. | Woolwich | Royal Arsenal | — |
| Bewley, A. W. | Agra, India |  | — |
| Beveridge, W. W. O., D.S.O., M.B. | London | Medical Officer, Royal Army Clothing Department | b. |
| Bray, G. A. T. | Southampton | Embarking Medical Officer | — |
| Buist, H. J. M., D.S.O., M.B. | War Office, London | Headquarter Staff | -- |
| Brogden, J. E. | Tientsin, N. China | Officer in charge Military Hospital | — |
| Begbie, F. W. | Mhow, India | Consulting Surgeon R.M. Railway, Specialist in Operative Surgery | — |
| Beyts, W. G. | Subathu, India | Officer in charge Military and Cantonment Hospital | — |
| Buchanan, G. J., M.B. | Bareilly, ,, |  | — |
| Bray, H. A. | R.A.M. College | Assistant Commandant and O.C. Detachment, R.A.M.C. | — |
| Buswell, F. R. | Aden |  | — |
| Berryman, H. A. | Gibraltar |  | o |
| Barnett, K. B., M.B., F.R.C.S.I. | Dover |  | m. |
| Boyle, M., M.B. | Lucknow, India | Specialist in Electrical Science | o. |
| Buist, John M., M.B. | Pretoria, S. Africa | Sanitary Officer Transvaal Dist. | b.c.p. |
| Blackham, R. J. | Devonport | Officer in charge Military Families' Hospital | b. h. |
| Birrell, E. T. F., M.D. | London |  | k. |
| Bliss, E. W. | Cosham | Specialist in Operative Surgery | j. |
| Clark, S. F., M.B. | Bloemfontein, S. Africa | Leave | b. |
| Copeland, R. J., M.B. | Meerut, India |  | — |
| Connor, J. C., M.B. | Parkhurst | Officer in charge Military Hospital | — |
| Crawford, G. S. | Malta | Leave | b. |
| Condon, E. H., M.B. | Jullundur, India | Staff Surgeon | — |
| Chambers, A. J. | Netley | Officer in charge Staff and Families | — |
| Collins, D. J., M.B. | Wynberg, S. Africa | ,, ,, Military Hospital | k. b. |
| Clark, E. S., M.B. | Nowshera, India | ,, ,, Cant. Hospital | f. |
| Cameron, K. M., M.B. | Calcutta, India | Staff Surgeon in charge Army Headquarters Staff and Establishments | j. |
| Carter, J. E., M.B. | Simons Town, Cape Colony | Leave | f. b. |
| Campbell, J. H., D.S.O. | Curepipe, Mauritius | Officer in charge Mil. Families' Hospital | h. |
| Cochrane, E. W. W., M.B. | Aldershot | Sanitary Officer A. C. | b. c. |
| Clements, R. W., M.B. | Wellington, India | Sanitary Officer 9th Division | o. b. p. |
| Durant, R. J. A. | Dum Dum, India | Officer in charge Military Hospital, Ammunition Factory, Cossipore and Dukinsore Factories, and Cantonment Outdoor Dispensary, and Civil Surgeon | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Dalton, C. | Rawalpindi, India | | — |
| Duggan, C. W., M.B. | Shwebo, India | Officer in charge Military Hospital | — |
| Dunn, H. N., M.B. | Ambala, India | | — |
| Dansey-Browning, G. | | Sick Leave | b. p. |
| Elliott, C. R., M.D. | Dublin | Sanitary Officer, Cork District | b. |
| Erskine, W. D., M.B. | Cairo, Egypt | Officer in charge, Abbassia | — |
| Evans, P., M.B. | Cairo, Egypt | Specialist in Operative Surgery | b. f. j. |
| Forde, B., M.B. | Bloemfontein, S. Africa | Company Officer | b. |
| Ferguson, J. D., D.S.O. | Aldershot | Instructor, R.A.M.C. School of Instruction | — |
| Faichnie, N., M.B. | Campbellpore, India | Officer in charge Military Hospital | b. p. |
| Fleming, C. C., D.S.O., M.B. | Cottonera, Malta | | — |
| Faichnie, F. G. | London | | — |
| Fowler, C. E. P., F.R.C.S. Eng. | Gibraltar | Sanitary Officer | k. b. |
| French, H. C. | Woolwich | Dermatologist | c.b. |
| Fleury, C. M. | Malta | | o. |
| Fox, A. C. | Tidworth | | h. |
| Fairrie, S. H., M.B. | Shorncliffe | Officer in charge Military Families' Hospital | h. |
| Forrest, J. V., M.B. | Woolwich | Adjutant, 12th and 34th Coys R.A.M.C. | — |
| Gray, W. L., M.B. | Winchester | Officer in charge Military Hospital | b. |
| Girvin, J. | | Leave | - |
| Graham, W. A. S. J. | Jubbulpore, India | Officer in charge Gun Carriage Factory | — |
| Gibbard, T. W., M.B. | Simla, India | | k. |
| Goodwin, T. H. J. C., D.S.O. | Quetta, India | | j. o. |
| Green, S. F. St. D., M.B. | Aldershot | Officer in charge Louise Margaret Hospital | h. |
| Grattan, H. W. | R.A.M. College, London | Special duty | b. c. |
| Grech, J. | Meerut, India | Specialist in Skiagraphy, Special Plague Officer | o. |
| Gunter, F. E., M.B. | Curragh | Specialist in Operative Surgery | j. |
| Hall, R. J. D. | Belfast | | — |
| Horrocks, W. H., M.B. | London | Sanitary Officer, London District | b. |
| Hale, C. H., D.S.O. | Secunderabad, India | | — |
| Holt, M. P. C., D.S.O. | Woolwich | In charge Surgical Division, Royal Herbert Hospital | j. |
| Hassard, E. M. | Shorncliffe | | — |
| Hallaran, W., M.B. | Amritsar, India | Officer in charge Military and Cantonment Hospital | — |
| Healey, C. W. R. | Fermoy | Anæsthetist | — |
| Hardy, F. W., M.B. | Cairo, Egypt | Sanitary Officer | b. |
| Healy, C. J., M.B. | Queenstown | Officer in charge Military Hospital | — |
| Hardy, W. E. | Pretoria, S. Africa | ,, ,, ,, Families' Hospital | — |
| Hennessy, J., M.B. | Poonamallee, India | Officer in charge Military Hospital | — |
| Hinge, H. A. | Ootacumund, India | Staff Officer Divisional Medical Mobilisation Stores, 9th Division | — |
| Harrison, W. S., M.B. | R.A.M. College | Assistant Professor of Pathology | c. |
| Howell, H. A. L. | Gibraltar | | f. |
| Hayes, E. C. | Colombo, Ceylon | Sanitary Officer | b. k. |
| Hooper, A. W., D.S.O. | Quetta, India | | — |
| Inniss, B. J. | Benares, India | Officer in charge Military Hospital | — |
| Julian, O. R. A., C.M.G. | Peshawar, India | Staff Surgeon | b. |
| Jackson, R. W. H., M.B. | Up Park Camp, Jamaica | Officer in charge Military Hospital and Com. 29th Coy. R.A.M.C., Sanitary Officer | b. |
| Jennings, J. W., D.S.O. | Mandalay, India | Officer in charge Military Hospital | o. |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Jameson, J. C., M.B. | Cairo, Egypt | Company Officer | b. |
| Johnson, H. P., M.R.C.P. Lond. | Standerton, South Africa | ,, ,, and Anæsthetist | — |
| Jones, T. P., M.B. | Kowloon, S. China | Officer in charge Military Hospital | — |
| Kelly, J. F. M., M.B. | Cork | | — |
| Keble, A. E. C. | Gibraltar | Officer in charge Garrison Disp. | h. b. |
| Kiddle, F., M.B. | Secunderabad, India | Specialist in Ophthalmology, 9th Division | k. |
| Killery, St. J. B. | Bhamo, India | | — |
| Leishman, W. B., M.B (Brevet-Lieut.-Col.) | R.A.M. College, London | Professor of Pathology | — |
| Luther, A. J. | Rangoon, India | Officer in charge Military Hospital | — |
| Lenehan, T. J., M.B. | Simonstown, S. Africa | | — |
| Lawson, C.B., M.B. | Valetta, Malta | Bacteriologist and Anæsthetist | o. j. |
| Lewis, R. C. | Pembroke Dock | Officer in charge Military Hospital | — |
| Longhurst, B. W. | Gibraltar | | d. |
| Lawson, D. | Netley | | — |
| Morgan, F. J. | Netley | In charge Surgical Division | — |
| McCulloch, T., M.B. | Lebong, India | Officer in charge Military Hospital | — |
| Macdonald, S., M.B. | Hong Kong | | — |
| Morgan, J. C. | Naini Tal, India | Sanitary Offi., 8th Lucknow Div. | b. |
| Mould, W. T. | Mount Abu, India | Officer in charge Military Hospital, Lawrence School and Residency Surgeon | — |
| McLoughlin, G. S., D.S O., M.B. | Colchester | | — |
| Mawhinny, R. J. W. | Athlone | Officer in charge Military Hospital | — |
| McDowell, F. | Peshawar, India | | — |
| MacCarthy, I. A. O. | Blakan Mati, Straits Setts. | Officer in charge Military Hospital | — |
| Morphew, E. M. | Delhi, India | ,, ,, ,, ,, | — |
| Mitchell, L. A., M.B. | Jhansi, India | | — |
| Martin, C. B., M.B. | Netley | Adjutant | |
| McNaught, J. G., M.D. | Wynberg, S. Africa | Sanitary Officer, Cape Colony | b. |
| McDermott, T., M.B. | Lucknow, India | Specialist in Ophthalmology | k. |
| More, L. P., M.B. | Rawalpindi, India | Staff Officer | — |
| Moore, G. A., M.D. | Woolwich | Med. Off. R.M. Academy | g. |
| Marder, N. | Netley | | — |
| Mansfield, G. S., M.B. | St. George's, Bermuda | Officer in charge Military Hospital | — |
| Mangin, F. M. | Aldershot | Specialist in Ophthalmology | k. |
| McMunn, J. R. | Pretoria, S. Africa | Leave | f. |
| Master, A. E., M.B. | Imtarfa, Malta | Officer in charge Military Hospital | g. |
| Morgan, C. K., M.B. | Cairo, Egypt | | o. |
| Milner, A. E. | St. Thomas' Mount, India | Officer in charge Military Hospital, Specialist in Skiagraphy | o. |
| Maurice, G. T. K. | Muttra, India | Specialist in Diseases of Women and Children | m. |
| Morris, A. H. | Edinburgh | Sanitary Officer | b. c. |
| MacDougall, A. J., M.B. | Glasgow | Adjutant, Lowland Division, R.A.M.C.T. | c. |
| O'Reilly, H. W. H., M.B. | Middelburg, Cape Colony | Officer in charge Mil. Families' Hospital, and Anæsthetist | — |
| Poole, W. C., M.B. | Buttevant | Officer in charge Military Hospital | b. |
| Pocock, H. I. | Aldershot | Specialist in Dental Surgery | d. |
| Peeke, H. S. | Campbellpore, India | | — |
| Parry, H. J., D.S.O., M.B. | Maritzburg, South Africa | Officer in charge Military Hospital | — |
| Powell, E. E. | Arundel | | — |
| Pearse, A. | Tower Hill, W. Africa | Senior Medical Officer and in charge Military Hospital | b. p. |
| Porter, F. J. W., D.S.O. | Colchester | | — |
| Pilcher, E. M., D.S.O., M.B., F.R.C.S.Eng. | Tanglin, Straits Setts. | Officer in charge Military Hospital and Officer Commanding 32nd Coy. R.A.M.C. | j. |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Pollock, C. E. | Valetta, Malta | Specialist in Venereal Diseases and Dermatology | e. o. |
| Prynne, H. V. | Gibraltar | | k. |
| Profeit, C. W., M.B. | Ambala, India | Staff Surgeon | g. |
| Perry, S. J. C. P... | Brighton | Officer in charge Military Hospital | o. |
| Probyn, P. J., D.S.O., M.B. | London | Sick Leave | b. |
| Raymond, G., M.B. | Wellington, India | Sanitary Officer, 9th Division | b. |
| Ritchie, J., M.B. | Woolwich | | — |
| Rawnsley, G. T. | Longmoor | Officer in charge Military Hosp. | — |
| Reilly, C. W. | Calcutta, India | ,, ,, Brigade Lab... | b. |
| Robinson, O. L. | Netley | Secretary and Registrar | b. |
| Read, H. W. K. | Allahabad, India | | — |
| Rivers, J. H. | Woolwich | Sick Leave | o. |
| Scott, B. H. | Edinburgh | Medical Inspector of Recruits | b. |
| Stone, C. A., M.D. | Bellary, India | Officer in charge Military Hospital | — |
| Smith, F., D.S.O. | Rawalpindi, India | Sanitary Officer, 2nd Division | b. |
| Smithson, A. E., M.B. | Harrismith, S. Africa | | b. p. |
| Shanahan, D. D. | Kilworth Camp | Officer in charge Troops | — |
| Stalkartt, C. E. G., M.D. | Gosport | ,, ,, Military Hospital | — |
| Stanistreet, G. B., M.B. | Salisbury | Staff Officer to Principal Medical Officer, Southern Command | — |
| Slayter, E. W., M.B. | Glasgow | Recruiting Duties | — |
| Symons, F. A., M.B. | Millbank, London | Registrar | — |
| Samman, C. T. | Shorncliffe | | n. b. |
| Spencer, C. G., M.B., F.R.C.S.Eng. | R.A.M. College, London | Professor of Military Surgery | j. |
| Silver, J. P., M.B. | Watford, Bermuda | Officer in charge Military Hospital | — |
| Sweetnam, S. W... | Warley | ,, ,, ,, ,, | — |
| Steel, E. B., M.B. | Nasirabad, India | Specialist in Mental Science | n. |
| Staddon, H. E. | Curragh | | — |
| Smith, L. F., M.B. | Royal Arsenal, Woolwich | | f. b. |
| Statham, J. C. B. | Pretoria, S. Africa | Bacteriologist | b. c. p. |
| Swabey, M. | Preston | | m. |
| Thurston, H. C., C.M.G. | War Office, London | Headquarter Staff | — |
| Thacker, R. C. | Karachi, India | Embarkation Staff Officer | — |
| Thomson, J., M.B. | Woolwich | Offi. in charge Mil. Families' Hosp. | — |
| Tate, G. W., M.B. | Dundalk | ,, ,, Military Hospital | b. |
| Tyacke, N. | Lahore Cantonment, India | | — |
| Thurston, H. S. | Millbank, London | Company Officer | — |
| Thompson, A. G., M.B | Cardiff | Officer in charge Military Hospital | b. |
| Taylor, W. J., M.B. | Kamptee, India | Officer in charge Cantonment Hosp. and Brigade Laboratory | o. |
| Tyrrell, A. F. | Gibraltar | | — |
| Tibbits, W., M.B. | Shahjehanpur, India | | — |
| Thom, G. St. C., M.B. | Lahore Cantonment, India | | l. g. |
| Watson, J. J. C., C.I.E., M.D., F.R.C.S.Edin. | Portsmouth | Officer in charge Staff and Departments | — |
| Watson, A. O. C., M.B. | Aberdeen | Officer in charge Military Hospital | b. |
| Weir, J. C., M.B. | Newcastle-on-Tyne | ,, ,, ,, ,, | b. |
| Winter, H. E. | Colaba, India | Embarking Medical Officer | — |
| Way, L. | Cosham | Company Officer | — |
| Williams, E. McK. | Tanglin, Straits Setts. | | — |
| Whitestone, C. W. H., M.B. | Hounslow | Officer in charge Heath Hospital, Kneller Hall | — |
| Wade-Brown, F. J. | London | In charge Kensington Barracks | — |
| Withers, S. H., M.B. | York | Company Officer and Anæsthetist | — |
| Williams, E. M. | Valetta, Malta | Officer in charge Mil. Families' Hospital | h. |
| Waring, A. H. | Secunderabad, India | Specialist in Electrical Science | o. |
| Ward, W. A. | Rochester Row, London | | e. |
| Young, C. A. | Curepipe, Mauritius | Officer in charge Military Hospital | — |

## CAPTAINS.

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Addams-Williams, L. | Standerton, S. Africa | | — |
| Archer, G. J. S., M.B. | Belfast | Specialist in Operative Surgery, and Company Officer | j. |
| Ashe, F. | Colchester | Offi. in charge Mil. Families' Hosp. | h. |
| Anderson, H. S. | Valetta, Malta | Coy. Offi. and Acting San. Offi. | — |
| Adye-Curran, W. J. P. | Bulford | Officer in charge Military Hospital | j. |
| Argles, R. L. | Multan, India | | — |
| Adderley, A. C. | Leeds | Officer in charge Military Hospital | — |
| Aylen, E. V. | Chatham | ,, ,, Casualty Hospital | e. |
| Adye-Curran, S. M. | Clogheen | ,, ,, Non-dieted Hosp. | b. |
| Ainsworth, R. B. | Poona, India | Officiating Sanitary Officer | b. |
| Ahern, D. | Karachi, India | ,, Staff Surgeon | — |
| Anderson, R. G. | Attached Egyptian Army | | — |
| Ahern, M. D. | Ferozepore, India | Staff Offi. and in Charge Ordnance Dept. and Followers' Hospital | — |
| Arthur, A. S., M.B. | Mhow, India | | — |
| Bowen, A. W. N. | Elizabeth Castle, Jersey | Officer in charge Military Hospital | — |
| Browne-Mason, H. O. B. | London | ,, ,, Wellington Barracks | c. |
| Berne, J. G. | Colaba, India | | g. |
| Bourke, E. A. | Bloemfontein, S. Africa | Officer in charge Families' Hospital | b. f. |
| Brodribb, E. | Shorncliffe | | k. |
| Barrow, H. P. W. | Manchester | Adjutant East and West Lancashire Division, R.A.M.C.T. | c. |
| Brakenridge, F. J. | Attached Egyptian Army | | b. |
| Blackwell, W. R. | Dublin | Company Officer | — |
| Butler, S. G. | Pretoria, S. Africa | ,, ,, | j. |
| Bond, J. H. R. | York | Officer in charge Staff and Departments | — |
| Babington, M. H. | Netley | Clinical Pathologist | c. |
| Buist, James M., M.B. | London | Leave | — |
| Baker, W. L. | Aldershot | | k. |
| Bennett, W., M.B. | Cork | | a. |
| Bartlett, B. S. | Norwich | | — |
| Bennett, E. | Wolverhampton | Adjutant North Midland Division R.A.M.C.T. | — |
| Brown, R. T., M.D. | R.A.M. College | | b. |
| Bennett, W. L., M.B., F.R.C.S.Edin. | Edinburgh | | — |
| Burke, B. B. | Woolwich | | — |
| Baillie, G., M.B. | Newbridge | Officer in charge Military Hospital | — |
| Black, R. B., M.B. | Attached Egyptian Army | | — |
| Brunskill, J. H., M.B. | Rangoon, India | Offi. in charge Bacteriological Lab. | — |
| Bateman, H. R. | R.A.M. College | | c |
| Bransbury, H. A. | London | | — |
| Barbour, J. H., M.B. | Londonderry | | — |
| Bostock, J. S., M.B. | Portsmouth | | — |
| Beatty, M. C., M.B. | Deolalee, India | Offi. in charge Cantonment Hosp. | b. |
| Balck, C. A. J. A., M.B. | Rawalpindi, India | | — |
| Bagshawe, H. V. | Lebong, India | | — |
| Browne, W. W. | Landour, India | | — |
| Bell, J. G., M.B. | Dalhousie, India | | — |
| Bridges, R. H. | Cannanore, India | Officer in charge Military Hospital | — |
| Brown, G. H. J., M.B. | Delhi, India | | — |
| Bramhall, C. | Karachi, India | | — |
| Bousfield, L., M.D. | Attached Egyptian Army | | — |
| Bowle, S. C. | Poona, India | | — |
| Byam, W. | Cairo, Egypt | | — |
| Beadnell, H. O. M. | Ambala, India | Leave | — |
| Corkery, M. P. | Woolwich | | a. |
| Clarke, T. H. M., C.M.G., D.S.O., M.B. | Lucknow, India | Leave | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Cummins, S. L., M.B. | Attached Egyptian Army | | c. |
| Carroll, F. F., M.B. | Woolwich | | j. |
| Carter, G. B., M.B. | Madras, India | Staff-Surgeon Fort St. George and in charge Bde. Laboratory, and Fort Dispensary | — |
| Collingwood, P. H. | Victoria, S. China | Company Officer | — |
| Crisp, G. B. | Meerut, India | | — |
| Cowan, J., M.B. | Woolwich | | c. |
| Curme, D. E. | Secunderabad, India | | — |
| Cunningham, R. A., M.B. | Portland | Officer in charge Military Hospital | — |
| Crawford, V. J. | Portsmouth | ,, ,, ,, Families' Hospital | h. |
| Chopping, A. | Peshawar, India | X-ray Specialist, 1st Division | — |
| Connolly, E. P. | Cardiff | Adjutant Welsh Div. R.A.M.C.T. | — |
| Cumming, C. C., M.B. | Colchester | | — |
| Carylon, A. F. | Millbank, London | | |
| Croly, W. C. | Wellington, India | | |
| Cotton, F. W. | Dover | Recruiting | — |
| Carroll, G. | Templemore | Officer in charge Military Hospital | — |
| Churton, J. G. | Aldershot | Specialist in Operative Surgery, Cambridge Hospital | j. |
| Cuthbert, J. M., M.B. | Thankerton | | c. |
| Carr, C. H., M.D. | Aden | Staff Surgeon Steamer Point and in charge Brigade Laboratory | |
| Crosthwait, W. S. | Bullpoint | | |
| Cautley, J. B. | Cawnpore, India | | d. |
| Cowey, R. V. | R.A.M. College | | — |
| Clarke, J. B., M.B. | Halifax | Officer in charge Military Hospital | — |
| Cotterill, L. | Edinburgh | Recruiting Duties | |
| Craig, B. A. | Dublin | | — |
| Crossley, H. J. | Calicut, India | Officer in charge Military Hospital | — |
| Clarke, F. A. H. | Ranikhet, India | ,, ,, Cantmnt. Hosp., Staff Surgeon | |
| Conway, J. M. H., F.R.C.S.I. | Aden | Offi. in charge Sect. Hosp. Crater | — |
| Coates, T. S., M.B. | Mhow, India | Specialist in Electrical Science | — |
| Carmichael, J. C. G., M.B. | Bellary, India | | — |
| Carmichael, D. G., M.B. | Wellington, India | | |
| Crawford, J. M. M. | Lahore Cant., India | Staff Surgeon | — |
| Collins, R. T. | Roorkee, India | ,, ,, | — |
| Cathcart, G. E. | Sialkot, India | | — |
| Cahill, R. J., M.B. | Peshawar, India | | |
| Connell, H. B. | Netley | | — |
| Campbell, J., M.B. | Allahabad, India | Officer in charge Brigade Lab. | b. |
| Cordner, R. H. L. | Attock, India | Officer in charge Military Hospital | — |
| Carter, H. St. M., M.D. | Valetta, Malta | | — |
| Delap, G. G., D.S.O. | Aldershot | Assist. Inst. R.A.M.C. School of Instruction | — |
| Douglas, H. E. M., V.C., D.S.O. | Lucknow, India | Leave | b. |
| Dennis, B. R., M.B. | Cosham | Bacteriologist | c. |
| Dorgan, J., M.B. | R.A.M. College | | — |
| Douglass, P. C. | Devonport | Anæsthetist and Company Officer | — |
| Duffey, A. C., M.D. | R.A.M. College | | — |
| Davidson, H. A., M.B. | Peshawar, India | Sanitary Officer | b. |
| Davis, W. | Fermoy | | — |
| Davidson, P., D.S.O., M.B. | Rawalpindi, India | Offi. in charge Cantonment Hosp. | — |
| Dawson, F. W. W., M.B. | Cape Town, S. Africa | Embarking Medical Officer | — |
| Dunbar, B. H. V., M.D. | Aden | | — |
| Duguid, J. H., M.B. | Glasgow | | — |
| Dudding, T. S. | Harrismith, S. Africa | | — |
| Dunkerton, N. E. | S. Africa | | — |
| Douglas, J. H., M.D. | Secunderabad, India | Offi. in charge Bgde. Laboratory, Spec. in Prevention of Disease | b. |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Dwyer, P., M.B. | Jubbulpore, India | Officer in charge Brigade Lab. | — |
| Davy, P. C. T., M.B. | Nowgong, India | | — |
| Doig, K. A. C. | Bareilly, India | | — |
| Ellery, E. E. | Devonport | Specialist in Operative Surgery, Southern Command | j. |
| Elsner, O. W. A. | Limerick | | — |
| Ensor, H., D.S.O., M.B. | Attached Egyptian Army | | — |
| Evans, C. R. | Newcastle-on-Tyne | | — |
| Ellery, R. F. | R.A.M. College | | — |
| Ellis, W. F. | Lahore Cant., India | Officer in charge Cantmnt. Hosp. | — |
| Fuhr, R. S. H., D.S.O. | Okehampton | | — |
| Fell, M. H. G. | Trawsfynydd | | b. p. |
| Falkner, P. H., F.R.C.S.I. | Chester | | — |
| Foster, J. G., M.B. | R.A M. College | | — |
| Ford, E. G., M.B. | York | | — |
| Fawcus, H. B., M.B. | R.A.M. College | Specialist in Bacteriology | a. b. |
| Fielding, T. E., M.B. | Curragh | Company Officer and Officer in charge Isolation Hospital | c. |
| Furnivall, C. H. | R.A.M. College | | — |
| Fitzgerald, Fitz G. G. | Dover | Company Officer | — |
| Fry, W. B. | R.A.M. College | | — |
| Fleming, C. E., M.B. | R.A.M. College | | — |
| Fawcett, R. F. M. | Bordon | | — |
| Falkner, M. W. | Winchester | | — |
| Foulds, M. F. | Tidworth | Company Officer 20th Company | — |
| Ffrench, E. G., M.D. | R.A.M. College | | — |
| Foster, R. L. V., M.B. | Egypt | | — |
| Franklin, R. J. | Darjeeling, India | | — |
| Fawcett, H. H. J. | Bloemfontein, S. Africa | | — |
| Fairbairn, J., M.B. | Colaba, India | | — |
| Fraser, A. N., M.B. | Monmouth | Officer in charge Military Hospital | — |
| Frost, A. T., M.B. | Victoria, S. China | | — |
| Gwynn, W. P. | Newport | Officer in charge Military Hospital | — |
| Gallie, J. S. | Ahmednagar, India | | — |
| Gill, J. G. | Netley | | — |
| Goddard, G. H. | Alderney | Officer in charge Military Hospital | h. |
| Goldsmith, G. M., M.B. | Lichfield | | — |
| Greenwood, A. R. | Aldershot | | — |
| Goodwin, W. R. P. | Royal Arsenal, Woolwich | | — |
| Gibson, A. W. | Chatham | | — |
| Gatt, J. E. H., M.D. | Middelburg, C.C. | | — |
| Gray, A. C. H., M.B. | Uganda, E. Africa | Seconded with Foreign Office | — |
| Glanvill, E. M., M.B. | Harrismith, S. Africa | | — |
| Grant, M. F. | Quetta, India | | — |
| Garland, F. J., M.B. | Ahmednagar, India | Officer in charge Cantmnt. Hosp. | — |
| Gater, A. W. | Lahore Cantmnt., India | | — |
| Hewetson, H. | Fort Canning, S. Setts. | Officer in charge Military Hospital, and Sanitary Officer, S. Setts. | a. b. |
| Hudleston, W. E. | Mhow, India | Officer in charge Station Staff | b. f. |
| Hopkins, C. H. | Belgaum, India | Leave | f. |
| Hall, S. O. | Secunderabad, India | Spec. in Midwifery and Diseases of Women and Children | h. |
| Heffernan, F. J. C, F.R.C.S.I. | Lucknow, India | | — |
| Herrick, H. | Richmond | Officer in charge Military Hospital | — |
| Hewitt, E. P. | Norwich | ,, ,, ,, ,, | — |
| Hodgson, J. E. | Willsworthy Camp | | — |
| Houghton, J. W. H., M.B. | Tower Hill, W. Africa | Sanitary Officer | b. |
| Harvey, D., M.B. | Naini Tal, India | Specialist in Prevention of Dis. | a. |
| Humphrey, L. | Poona, India | | j. |
| Harrison, L. W., M.B. | Millbank, London | Clinical Assistant | — |
| Harvey, F. | | Leave | b. c. |
| Hime, H. C. R., M.B. | Aldershot | Adjutant, Depôt R.A.M.C. | k. |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Hartigan, J. A., M.B. | Shorncliffe | | — |
| Hyde, D. O., M.B. | Colaba, India | In charge Brigade Laboratory | — |
| Hamerton, A. E., D.S.O. | R.A.M. College | | c. |
| Houghton, G. J. | Barrakpore, India | Officer in charge Cantmnt. Hosp. | — |
| Henderson, P. H., M.B. | R.A.M. College | | — |
| Hardy, F. H. | Colchester | | h. |
| Hunt, R. N., M.B. | R.A.M. College | | — |
| Howley, H. E. J. A. | R.A.M. College | | — |
| Hull, A. J. | Jutogh, India | Officer in charge Military Hospital | — |
| Harding, D. L., F.R.C.S.I. | Secunderabad, India | | — |
| Hyde, P. G., M.B. | Queenstown | Officer in charge Haulbowline | — |
| Harvey, W. J. S. | Wilberforce, W. Africa | Officer in charge Military Hospital, and Anæsthetist | — |
| Hayes, A. H. | Ambala, India | | — |
| Harding, N. E. J., M.B. | Rangoon, India | | — |
| Holden, C. W. | Peking, North China | Officer in charge Military Hospital | b. p. |
| Harty, T. E. | Calcutta, India | Leave | — |
| Hughes, G. W. G. | Attached Egyptian Army | | — |
| Hanafin, P. J. | Pretoria, S. Africa | | b. |
| Hildreth, H. C., F.R.C.S. Edin. | Maymyo, India | | — |
| Hole, R. B., M.B. | Karachi, India | Leave | — |
| Harding, H., M.B. | Quetta, India | | — |
| Hayes, G. S. C. | Millbank, London | | — |
| Hallowes, R. C., M.B. | Cyprus | Officer in charge Military Hospital | — |
| Harvey, G. A. D. | Alexandria, Egypt | | — |
| Inkson, E. T., V.C. | London | Adjutant 1st and 2nd London Division R.A.M.C.T. | — |
| Irvine, F. S., M.B. | | Seconded for service under the Colonial Office | — |
| Irwin, A. W. A. | Kildare | Officer in charge Non-dieted Hosp. | — |
| Ievers, O., M.B. | Middelburg, Cape Colony | | — |
| Jameson, A. D. | Aldershot | Specialist in Dermatology and Venereal Disease | c. |
| Johnson, J. T., M.D. | R.A.M. College | | — |
| Jones, J. L. | Devonport | | — |
| Johnstone, D. P. | Bangalore, India | | b. |
| Knox, E. B., M.D. | Meerut, India | Temporary Staff Officer Medical Mobilisation Store, 7th Division | b. |
| Kennedy, J. C., M.B. | Millbank, London | Clinical Assistant | — |
| Kiddle, H. H. | Aldershot | | — |
| Kelly, W. D. C., M.B. | Rawalpindi, India | | — |
| Kelly, H. B., M.B. | Bangalore, India | | — |
| Kempthorne, G. A. | Lahore Cantonmt., India | Leave | — |
| Lowsley, M. M. | Aldershot | | h. |
| Lauder, T. C., M.B. | Stobs and Hawick | Officer in charge Field Hospital | b. |
| Leake, J. W. | Bude Camp | ,, ,, Troops | a. b. |
| Lloyd, R. H. | Exeter | Adjutant Wessex Div. R.A.M.C.T. | — |
| Langstaff, J. W. | Tower Hill, W. Africa | Anæsthetist | b. |
| LLoyd, L. N., D.S.O. | Maidstone | Adjutant Home Counties Division R.A.M.C.T. | — |
| Lauder, F. P. | Tower Hill, W. Africa | | — |
| Lelean, P. S., F.R.C.S. Eng. | Meerut, India | Temp. Sanitary Officer, 7th Div. | b. j. |
| L'Estrange, E. F. Q. | Manchester | Officer in charge Military Hospital | — |
| Lambelle, F. W., M.B. | York | Specialist in Operative Surgery | j. |
| Long, H. W., M.B. | Bere Island | Officer in charge Non-dieted Hosp. | — |
| Lambert, F. C. | Potchefstroom, S. Africa | | — |
| Lewis, S. E., M.B. | Standerton, S. Africa | Officer in charge Staff and Departments, Women and Children | — |
| Lewis, R. R. | Secunderabad, India | Specialist in Dermatology | — |
| Lucas, T. C., M.B. | Poona, India | | — |
| Luxmoore, E. J. H. | Meerut, India | | — |
| Low, N. | Madras, India | Leave | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Lloyd-Jones, P. A., M.B. | Ghain Tufficha, Malta | Officer in charge Non-dieted Hosp. | — |
| Lynch, J. P. | Rangoon, India | | — |
| Marriott, E. W. P. V. | Gibraltar | | o. |
| McKessack, P., M.B. | Edinburgh | Company Officer | b. c. |
| McCarthy, J. McD., M.B. | Chester | Sanitary Officer, Western Com. | a.b.p. |
| Martin, H. G. | Agra, India | Specialist in Midwifery, Gynæcology and Electrical Science, Special Plague Officer | h. |
| Macpherson, J. D. G., M.B. | Aldershot | Officer commanding "A" Company, Depôt R.A.M.C. | — |
| Mainprise, C. W. | ,, | | — |
| MacKenzie, T. C., D.S.O. | Attached Egyptian Army | | — |
| Morton, H. M., M.B. | Aldershot | | — |
| Matthews, J. | Woolwich | Specialist in Ophthalmology | k. |
| McLoughlin, W. M. | R.A.M. College | | — |
| MacLaughlin, A. M., M.B. | Windsor | | a. |
| Martin, J. F., M.B. | Poona, India | | — |
| McDonnell, E., M.B. | Aldershot | Company Officer, No. 2 Company | — |
| McLennan, F., M.B. | Fort George | Officer in charge Military Hospital | — |
| Murphy, J. P. J., M.B. | Liverpool | Recruiting | — |
| McGrigor, H. J., M.B. | | Leave | b. e. |
| Myles, C. D., M.B. | Jhansi, India | | — |
| Mitchell, A. H. McN. | Bury | Officer in charge Military Hospital | — |
| McMunn, A. | Omagh | ,, ,, ,, ,, | |
| McKenzie, J. M. B. | Lucknow, India | | — |
| Meadows, S. M. W. | Rawalpindi, India | Officer in charge Mil. Families' Hosp. and Staff Surgeon "A" | — |
| Meldon, J. B. | Bangalore, India | | — |
| MacNicol, R. H., M.B. | Secunderabad, India | | — |
| McEntire, J. T., M.B. | Potchefstroom, S. Africa | Leave | — |
| MacDowell, W. MacD. | Kamptee, India | | — |
| Moore, E. H. M. | Wynberg, C.C. | Leave | — |
| Meaden, A. A. | Neemuch, India | | — |
| Mackenzie, J. F. C., M.B. | Landour, India | | — |
| Millar, C. R. | Colombo, Ceylon | | — |
| Maughan, J. St. A. | Cottonera, Malta | | — |
| Norrington, H. L. W. | Chatham | Officer in charge Military Families' Hospital | h. |
| Nickerson, W. H. S., V.C., M.B. | York | Sanitary Officer, Northern Com. | b. c. |
| Nickerson, G. S., M.B. | Attached Egyptian Army | | — |
| Nicholls, H. M., M.B. | Kinsale | Officer in charge Military Hospital | — |
| Norman, H. H. | Shwebo, India | | — |
| Nokes, F. H., M.B. | Poona, India | Officer in charge Cantonmt. Hosp. | — |
| O'Grady, S. de C., M.B. | Alexandria, Egypt | | a. |
| O'Gorman, C. J., D.S.O. | Port Lokkoh, W. Africa | Officer in charge Military Hospital | — |
| O'Flaherty, A. R. | R.A.M. College | | — |
| Ormsby, G. J. A., M.D. | Fyzabad, India | | — |
| O'Reilly, P. S. | Cosham | Specialist in Ophthalmology | k. |
| O'Donoghue, D. J. F. | Naas | Officer in charge Military Hospital | — |
| Ommanney, F. M. M. | Lahore Cant., India | | — |
| Osburn, A. C. | Bhamo, India | Temp. Officer in charge Mil. Hosp. | — |
| Otway, A. L., M.B. | Nasirabad, India | Officer in charge Cantonmt. Hosp. | — |
| Poe, J., M.B. | Aldershot | | — |
| Penny, F. S., M.B. | Shoeburyness | | a. |
| Parker, L. E. L. | Aldershot | | c. b. |
| Packer, H. D. | Mabanta, West Africa | Officer in charge Military Hospital | c. |
| Palmer, H. K. | Colchester | Company Officer and Officer in charge Detention Barracks | — |
| Palmer, F. J. | Dublin | Specialist in Operative Surgery | j. |
| Prescott, J. J. W., D.S.O. | ,, | Specialist in Ophthalmology and Anæsthetist | k. |
| Parry, F. M., M.B. | Millbank, London | | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Powell, J., M.B. | | *En route* to West Africa | — |
| Purser, L. M., M.B. | Colchester | | l. |
| Popham, R. L. | R.A.M. College | | — |
| Power, W. M. | Aldershot | | — |
| Pinches, H. G. | Allahabad, India | | — |
| Parsons, A. R. C. | Mill Hill | Officer in charge Military Hospital | j. |
| Powell, E. W. | Belgaum, India | ,, ,, Brigade Lab. | c. |
| Parkes, E. E., M.B. | Sheerness | | — |
| Potter, T. J. | R.A.M. College | | b. |
| Pennefather, E. M. | Maymyo, India | Staff-Surgeoncy | — |
| Patch, B. G. | Ambala, India | | — |
| Powell, J. E. | Bareilly, India | Officer in charge Cantonmt. Hosp., Staff Surgeon | — |
| Pallant, S. L. | Mhow, India | | — |
| Painton, G. R. | Up Park Camp, Jamaica | | — |
| Riddick, G. B. | Calcutta, India | Officer in charge Garrison Dispensary, Fort William, Dep. Followers' Hospital, Staff Surgeon | — |
| Rattray, M. MacG., M.B. | Bangalore, India | | — |
| Ross, N. H., M.B. | | Leave | |
| Rutherford, N. J. C., M.B. | | *En route* to West Africa | |
| Richards, F. G. | Netley | | — |
| Roch, H. S. | Leeds | Adjutant West Riding and Northumbria Division R.A M.C.T. | c |
| Robinson, J. H. | R.A.M. College | | |
| Ronayne, C. R. L., M.B. | Bradford | Officer in charge Military Hospital | — |
| Riach, W., M.D. | R.A.M. College | | b. |
| Ryan, E. | Edinburgh | Offi. in charge Staff & Departments | — |
| Rowan-Robinson, F. E., M.B. | Woolwich | | — |
| Ritchie, T. F., M.B | Finner Camp | | |
| Rogers, H., M.B. | Tipperary | Officer in charge Military Hospital | — |
| Reed, G. A. K. H. | Saugor, India | | — |
| Rutherford, R., M.B. | Purandhar, India | Officer in charge Military Hospital | — |
| Ranking, R. M., M.B. | Victoria, S. China | | |
| Richmond, J. D., M.B. | Quetta, India | Staff Surgeon | |
| Rugg, G. F. | Colchester | | — |
| Ryley, C. | Victoria, S. China | Sanitary Officer, S. China | b. |
| Russell, H. W., M.D. | Port Royal, Jamaica | Officer in charge Military Hospital | — |
| Richard, G. H. | Calcutta, India | | — |
| Stammers, G. E. F. | Tidworth | Sanitary Officer, Eastern Area, Southern Command | a. |
| Stallard, H. G. F. | Aldershot | Officer commanding "C" Company Depôt, R.A.M.C. | — |
| Selby, R., M.B. | Meerut, India | Specialist in Dermatology, Staff Surgeon | c. |
| Scott, A. L. | Mount Auriol, W. Africa | Officer in charge Military Hospital | c. |
| Sloan, J. M., M.B., D.S.O. | Aberdeen | Adjt. Highland Div. R.A.M.C.T. | a. |
| Simson, H. | Millbank, London | | a. |
| Seeds, A. A., M.D. | Aldershot | | — |
| Siberry, E. W. | Aldershot | Acting Coy. Officer, Nos. 1 & 3 Coy. | — |
| Smith, C. S., M.B. | Curepipe, Mauritius | | — |
| Safford, A. H. | St. John's Wood, London | Officer in charge Military Hospital | c. |
| Sewell, E. P., M.B. | Aldershot | | a. b. |
| Straton, C. H. | Millbank, London | | — |
| Spiller, W. M. H., M.B. | Belfast | Anæsthetist | b. |
| Shea, H. F., M.B. | Millbank, London | | — |
| Stephens, F. A. | Birmingham | Adjutant South Midland Division R.A.M.C.T. | — |
| Steele, W. L. | Lucknow, India | Specialist in Operative Surgery, 8th Division, Staff Surgeon | |
| Sparkes, W. M. B. | R.A.M. College | | — |
| Smith, S. B., M.D. | Dagshai, India | Officer in charge Cantonmt. Hosp. | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Skinner, R. McK. | Barry Buddon | | — |
| Sheehan, G. F. | Curragh | | n. |
| Sampey, A. W. | | Leave | b. p. |
| Smallman, A. B., M.B. | Quetta, India | Officiating Sanitary Officer | b. |
| Storrs, R. | Ambala, India | | — |
| Seccombe, J. W. S. | Bangalore, India | Offi. in charge Bde. Lab., Specialist in Prevention of Disease | b. |
| Skelton, D. S. | | Leave | — |
| Stanley, C. V. B., M.D. | Egyptian Sanitary Dept. | | — |
| Stack, H. T., M.B. | Sitapur, India | | — |
| Sylvester-Bradley, C. R. | Belgaum, India | Officer in charge Cantonmt. Hosp. | — |
| Sidgwick, H. C., M.B. | Piershill and Leith Fort | ,, ,, Troops | — |
| Sinclair, M., M.B. | Sialkot, India | Leave | — |
| Thorp, A. E. | Honiton Camp | | — |
| Taylor, H. S. | Glen Imaal Camp | Officer in charge Non-dieted Hosp. | — |
| Tobin, J. | Lincoln | ,, ,, Military Hospital | h. |
| Thorpe, L. L. G. | Warley | | — |
| Thomson, C. G. | Jullundur, India | | — |
| Tyndale, W. F., C.M.G., M.B. | Lucknow, India | Instructor in Practical Sanitation | b. |
| Turner, F. J. | Jubbulpore, India | | — |
| Thomson, D. S. B., M.B. | Attached Egyptian Army | | — |
| Turner, C. H. | Rawalpindi, India | | — |
| Turnbull, J. A. | Peshawar, India | | — |
| Thurston, L. V. | Mhow, India | | — |
| Unwin, T. B., M.B. | Cork | | — |
| Vaughan, W. F. H. | Malappuram, India | Leave | — |
| Wanhill, C. F. | R.A.M. College | Assistant Professor of Hygiene | b. c. |
| Watts, B. | Fermoy | Offi. in charge Mil. Families' Hosp. | b. h. |
| Weld, A. E. | Curragh | In charge Military Families' Hosp. | h. |
| Walton, H. B. G. | Pontefract | Officer in charge Military Hospital | b. c. |
| Winkfield, W. B. | Gosport | | — |
| Wroughton, A. O. B. | Cannanore, India | Leave | — |
| Woodside, W. A. | Ipswich | Adjutant East Anglian Division R.A.M.C.T. | — |
| Webb, A. L. A. | R.A.M. College | | a. b. |
| Winslow, L. F. F. | Bodmin | Officer in charge Military Hospital | — |
| Wood, L. | Fleetwood | ,, ,, ,, ,, | — |
| Wingate, B. F. | Canterbury | Recruiting | — |
| Walker, F. S., F.R.C.S.I. | Ferozepore, India | | — |
| Waring, A. D., M.B. | Curragh | Sick leave | — |
| Weston, A. F. | Mount Auriol, W. Africa | | c. |
| Waters, W. J. | R.A.M. College | | — |
| Whelan, J. F., M.B. | Warrington | Officer in charge Military Hospital | — |
| West, J. W., M.B. | Ballykinler Camp | ,, ,, Troops | j. |
| Worthington, E. S. | Birr | ,, ,, Military Hospital | — |
| Wells, A. J. W. | Aldershot | | — |
| Woodley, R. N. | Cork | Company Officer and Anæsthetist | — |
| Winder, J. H. R., M.D. | Mosney Camp | | — |
| Wilson, R. C., M.B. | Dublin | | — |
| Williamson, A. J., M.B. | Bulford | | — |
| Walker, N. D., M.B. | Hyderabad, India | | — |
| Webb, H. G. S. | Ambala, India | In charge X-ray Apparatus | b. |
| Winder, M. G. | Dover | Officer in charge Detention Ward, Dover Castle | — |
| Wood, A. E. B., M.B. | Fyzabad, India | | — |
| Webster, J. A. W. | Poona, India | Leave | — |
| Wilmot, R. C. | Kirkee, India | Officer in charge Ammun. Factory | — |
| Watson, D. P., M.B. | Quetta, India | | — |
| Wetherell, M. C., M.D. | Rawalpindi, India | | — |
| Wright, T. J. | Maymyo, India | | b. |
| Whitehead, E. C., M.B. | Pretoria, S. Africa | | — |
| Wiley, W., M.B. | Secunderabad, India | | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Wilson, H. T. | Rawalpindi, India | | — |
| Winkworth, H. C. | Cottonera, Malta | | d |
| Young, A. H. O. | St. George's, Bermuda | Officer in charge Women and Children | — |

## LIEUTENANTS.

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Anderson, J. A., M.B. | Bloemfontein, S. Africa | | — |
| Anthonisz, E. G. | Wellington, India | | |
| Archibald, R. G., M.B. | Uganda | | |
| Amy, A. C., M.B. | Aldershot | | |
| Aviss, W. G. | Lichfield | | — |
| Andrews, L. A. A. | Ashton | | |
| Buchanan, R. J. B. | Vacoas, Mauritius | Offi. in charge Non-Dieted Hosp. | b. |
| Booth, E. B., M.B. | Kamptee, India | | — |
| Brown, C. G. | Sialkot, India | | — |
| Benson, W., M.B. | Rawalpindi, India | | — |
| Bryden, R. A. | Bloemfontein, S. Africa | | |
| Blackwell, T. S. | Secunderabad, India | Sick Leave | — |
| Bond, A. H. | Maymyo, India | | |
| Benett, A. M. | Jubbulpore, India | Staff Surgeon | — |
| Bradish, F. L. | Queenstown | Offi. in charge Fort Westmoreland | |
| Bracken, G. P. A. | Ballincollig | | |
| Boyce, W. W. | Dublin | | |
| Bell, W. J. E., M.B. | York | | |
| Bowle, C. W. | Weedon | Officer in charge Military Hospital | |
| Bennett, J. A., M.B. | Cosham | | |
| Browne, W. T. | Fethard | Officer in charge Troops | |
| Beaman, W. K. | Woolwich | | |
| Boyd, J. E. M. | Caterham | | |
| Byatt, H. V. B. | Netley | | |
| Blake, H. H., M.B. | R.A.M. College | On probation | |
| Bradley, F. H., M.B. | ,, ,, | ,, | |
| Burney, W. H. S. | ,, ,, | ,, | |
| Churchill, G. B. F. | Bareilly, India | | |
| Cromie, M. J. | ,, ,, | | |
| Cummins, A. G., M.B. | Nuwara Eliya, Ceylon | Officer in charge Military Hosp. | |
| Caddell, E. D., M.B. | Dublin | | — |
| Corbett, D. M., M.B. | Curragh | | — |
| Cooke, O. C. P. | Plymouth | | — |
| Coutts, D., M.B. | Larkhill Camp | | — |
| Cassidy, C. | | On probation | — |
| Chapman, F. H. M. | Rollestone Camp | | |
| Carruthers, V. T., M.B. | Strensall | | — |
| Casement, F., M.B. | Killbride Camp | | — |
| Conyngham, C. A. T., M.B. | Curragh | | — |
| Carson, H. W., M.B. | Conway | | |
| Dunne, J. S. | Bareilly, India | | — |
| Drew, C. M., M.B. | Gibraltar | | — |
| De la Cour, G., M.B., B.S. | Peshawar, India | | — |
| Dawson, A., M.B. | Mhow, India | | — |
| Dill, M. G., M.B. | Edinburgh | | — |
| Denyer, C. H. | Rochester Row, London | | — |
| Dickson, H. S. | Bulford | | — |
| Dawson, G. F., M.B. | Colchester | | — |
| Dickenson, R. F. O'T. | Limerick | | — |
| Dowling, F. T., M.B. | Wedgnock Park Camp | | — |
| Dunn, W. J., M.B. | R.A.M. College | On probation | — |
| Dalgleish, F. B. | ,, ,, | ,, | — |
| Dickson, R. M., M.B. | ,, ,, | ,, | — |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Davis, A. H. T. | R.A.M. College | On probation | — |
| Emerson, H. H. A., M.B. | Prospect, Bermuda | Officer in charge Staff and Depts., Officers, Women and Children | — |
| Egan, W., M.B. | Multan, India | | — |
| Edmunds, C. T. | Nowshera, India | | — |
| Edwards, G. B. | Gosport | | — |
| Elliot, E. J., M.B. | Tidworth | Anæsthetist | — |
| Elliott, A. C., M.B | Kilkenny | Officer in charge Military Hospital | — |
| Ellcome, J. E. | R.A.M. College | On probation | — |
| Eves, T. S., M B. | ,, ,, | ,, | |
| Ferguson, G. E. | Alexandria, Egypt | | — |
| Fawcett, C. E W S., M.B. | Bangalore, India | | — |
| Farrant, P. | Up Park Camp, Jamaica | | — |
| Forrest, F. | Multan, India | | — |
| Forsyth, W. H., M.B. | Middelburg, C.C., S. Africa | Anæsthetist and Skiagraphist | — |
| Foster, J. R. | Woolwich | | — |
| Fraser, A. D., M.B. | R.A.M. College | | — |
| Fortescue, A., M.B. | Fordingbridge Camp | | — |
| Field, S. | Bordon | | — |
| Farebrother, H. W. | Altcar | | — |
| Foster, A. L. | R.A.M. College | On probation | — |
| Fraser, A. E. G. | ,, | ,, | — |
| Gibbon, T. H., M.D. | Malta | Leave | — |
| Graham, J. H., M.B. | Cairo, Egypt | Anæsthetist | — |
| Gotelee, H. E. | Kandy, Ceylon | Officer in charge Military Hospital | — |
| Galwey, W. R., M.B | Dublin | | - |
| Gillatt, W. H., M.B. | Aldershot | | — |
| Gibson, L. G. | Lahore Cantonment, India | | — |
| Gibbon, E., M.B. | Deepcut and Blackdown | | — |
| Galgey, R. C. | Port Royal, Jamaica | | — |
| Gibson, H. G. | Woolwich | | — |
| Gurley, J. H. | Dover | | |
| Gibson, H. | Wool Camp | | — |
| Gregg, R. G. S., M.B. | Dublin | | — |
| Grant, J. F., M.B. | | On probation | — |
| Heron, G. W. | Cairo, Egypt | | - |
| Hoar, J. E. | Secunderabad, India | | — |
| Holbrooke, C D. M. | Khandalla, India | Officer in charge Military Hospital | — |
| Humfrey, R. E., M.B. | Mhow, India | | — |
| Hastings, A. E. F. | Allahabad, India | Officer in charge Sect. Hosp. Fort | — |
| Honeybourne, V. C. | Rawalpindi, India | | — |
| Howell, F. D. G | Meerut, India | | — |
| Heslop, A. H., M B. | Aldershot | Anæsthetist, Cambridge Hospital | - |
| Howell, H. L. | Shorncliffe | | — |
| Hart, J. C., M.B. | Aldershot | Anæsthetist, Connaught Hospital | — |
| Hanafin, J. B. | ,, | | — |
| Hingston, J. C. L. | ,, | | — |
| Hart, H. P., M.B. | Chatham | | — |
| Hendry, A., M.B. | Bulford | | — |
| Harding, C. E. L., M.B. | R.A.M. College | On probation | — |
| Houston, J. W., M.B. | ,, ,, | ,, | — |
| Hewson, F. M. | , | | — |
| Irvine, A. E. S. | Potchefstroom, S. Africa | | — |
| Johnson, V. G. | Nowshera, India | | — |
| Johnson, B. | Queenstown | Officer in charge, Carlisle | — |
| Jacob, A. H. | Rawalpindi, India | | — |
| Jones, A. E. B., M.D. | Canterbury | | — |
| James, J., M.B. | R.A.M. College | On probation | — |
| Keane, [illegible] | Meerut, India | | — |
| Kelly, [illegible] M.B. | Churn Camp | | - |
| Kavana[illegible] E. J., M.B. | Meerut, India | | - |
| King, R[illegible] V. | Ewshott | Officer in charge Detention Hosp. | — |
| Keane, [illegible]., M.D. | R.A.M. College | On probation | b. |

| Name. | Station. | Appointment. | Specialist Certificates in |
|---|---|---|---|
| Lithgow, E. G. R. | Rawalpindi, India | | — |
| Lewis, R. P. | Bloemfontein, S. Africa | | — |
| Littlejohns, A. S. | Pretoria, S. Africa | | — |
| Leslie, T. C. C. | Maritzburg, S. Africa | Officer in charge Staff and Departments and Married Families | |
| Lathbury, E. B. | Woolwich | | — |
| Leslie, R. W. D. | Crete | | — |
| Lochrin, M. J. | Kendean Camp | Offi. in charge Non-dieted Hosp. | — |
| Lunn, W. E. C., M.B. | Edinburgh | | — |
| Loughnan, W. F. M. | Cosham | | — |
| Leahy, M. P., M.B. | Curragh | | — |
| Langrishe, J. du P., M.B. | Llanfyllin | | — |
| Lumb, T. F. | | On probation | — |
| Lloyd, J. R. | | ,, | — |
| Leckie, M. | R.A.M. College | ,, | — |
| Meredith, R. G., M.B. | Crete | | — |
| McNeight, A. A., M.B. | Cawnpore, India | | — |
| Maydon, W. G. | Dinapore, India | | — |
| Moriarty, T. B. | Cawnpore, India | Officer in charge Departmental Followers' Hospital | — |
| Moss, E. L. | Agra, India | | — |
| McConaghy, W., M.B. | Pretoria, S. Africa | | — |
| Marett, P. J. | Forrest, Malta | | — |
| McCammon, F. A., M.B. | Quetta, India | | — |
| Morris, C. R. M., M.B. | Rawalpindi, India | | — |
| Mulligan, J. B. G. | Valetta, Malta | | — |
| Mitchell, W., M.B. | York | | — |
| McCarthy, D. T., M.B. | Tregantle | Officer in charge Military Hospital | — |
| Mackenzie, D. F., M.B. | Tidworth Pennings | | p. |
| Middleton, E. M. | Colchester | | — |
| McEwen, O. R. | Chapel Bay | | — |
| McGrigor, D. B., M.B. | Chatham | Anæsthetist | — |
| Murphy, L. | R.A.M. College | On probation | — |
| McQueen, C. | ,, ,, | ,, | — |
| McCombe, J. S., M.B. | ,, ,, | ,, | — |
| Nealor, W. S. | Thayetmyo, India | | — |
| Nimmo, W. C. | Fyzabad, India | | — |
| Newman, R. E. U., M.B. | India | | — |
| O'Brien, C. W. | Peshawar, India | Specialist in Operative Surgery, 1st Division | — |
| Ormrod, G., M.B. | Rangoon, India | | — |
| O'Carroll, A. D., M.B. | Rawalpindi, India | | — |
| O'Neill, E. M., M.B. | Jhansi, India | | — |
| O'Grady, D. De C. | Nowshera, India | | — |
| O'Keeffe, J. J., M.B. | Hilsea | | — |
| O'Connor, R. D. | Tidworth | | — |
| O'Farrell, W. R. | Pirbright Camp | | — |
| Odlum, B. A. | Fargo Camp | | — |
| O'Brien-Butler, C. P. | | On probation | — |
| O'Kelly, R. | R.A.M. College | ,, | — |
| Power, P., M.B. | Up Park Camp, Jamaica | In charge Women and Children | — |
| Pascoe, J. S. | Cairo, Egypt | | — |
| Potts, E. T., M.D. | Pretoria, S. Africa | Anæsthetist | — |
| Priestley, H. E. | Gibraltar | ,, | — |
| Paine, E. W. M. | Malappuram, India | Officer in charge Military Hospital | — |
| Phelan, E. C., M.B. | Ipswich | ,, ,, ,, ,, | — |
| Purdon, W. B., M.B. | Aldershot | | — |
| Perry, H. M. J. | Queenstown | Officer in charge, Camden | — |
| Phillips, T. McC., M.B. | Dunree Camp | | — |
| Petit, G. | Lodmoor Camp | | — |
| Roberts, F. E. | Forrest, Malta | | — |
| Rahilly, J. M. B., M.B. | Khartoum, Egypt | | — |
| Rose, A. M., M.B. | Prospect, Bermuda | Leave | b. |

| Name | Station. | Appointment. | Specialist Certifi-cates in |
|---|---|---|---|
| Rees, G. H., M.B. | Cairo, Egypt | Officer in charge Military Families Hospital | — |
| Ritchie, M. B. H. | Rawalpindi, India | | — |
| Robinson, T. T. H., M.B. | Mhow, India | | — |
| Rudkin, G. F. | Pembroke Dock | | — |
| Renshaw, J. A. | Dover | | — |
| Rigby, C. M. | R.A.M. College | On probation | — |
| Sherren, H. G. | Belgaum, India | Special duty with 2nd Leicestershire Regiment | — |
| Scatchard, T. | Fategarh, India | Officer in charge Military Hospital | — |
| Symons, V. H. | Bloemfontein, S. Africa | | — |
| Sampson, F. C., M.B. | Middelburg, Cape Colony | | — |
| Smyth, R. S., M.B. | Ambala, India | | — |
| Stewart, H., M.B. | Rawalpindi, India | | — |
| Sutcliff, A. A., M.B. | Blakan Mati, S. Setts. | | — |
| Sampson, P. | Jhansi, India | | — |
| Scott, J. W. L. | Quetta, India | | — |
| Smales, W. C. | Poona, India | | — |
| Stewart, P. S., M.B. | Mellieha, Malta | Officer in charge Non-dieted Hosp. | — |
| Sexton, T. W. O. | Potchefstroom, S. Africa | Sanitary Officer | — |
| Stevenson, G. H., M.B. | Ambala, India | | — |
| Spencer, J. H., M.B. | Gibraltar | | — |
| Sim, J. A. B., M.B. | Glencorse | Officer in charge Military Hospital | — |
| Scaife, C., M.D. | Maryboro' Heath Camp | „ „ Non-dieted „ | b. |
| Scott, T. H., M.B. | Sheffield | | — |
| Stuart, F. J., M. B. | Chatham | | — |
| Spong, W. A., M.B. | Leeds | | — |
| Suhr, A. C. H., M.B. | R.A.M. College | On probation | — |
| Stevenson, A. L., M.B. | „ „ | „ | — |
| Shepherd, A., M.B. | „ „ | „ | — |
| Thomson, C. P., M.D. | Cairo, Egypt | | — |
| Thompson, R. J. C. | Pretoria, S. Africa | | — |
| Tabuteau, G. G. | Jhansi, India | Staff Surgeon | — |
| Tate, R. G. H., M.D. | Rawalpindi, India | | b. |
| Thompson, W. I., M.B. | Bordon | | |
| Turner, F. T. | Netley | | — |
| Todd, R. E., M.B. | | On probation | — |
| Treves, H. T. | Pirbright Camp | | — |
| Tobin, W. J. | R.A.M. College | On probation | — |
| Vidal, A. C. | Aldershot | | |
| Varvill, B. | R.A.M. College | On probation | |
| Wallace, G. S., M.B. | Port Louis, Mauritius | Officer in charge Military Hospital and Sanitary Officer, Mauritius | b. |
| Weston, W. J. | Gibraltar | | — |
| Ware, G. W. W., M.B. | Lucknow, India | Offi. in charge Detention Barracks | — |
| White, C. F., M.B. | „ „ | | — |
| Wyatt, C. J., M.B. | Tanglin, Straits Setts. | | — |
| Williams, A. S. | Lucknow, India | | — |
| Wood, J. L. | R.A.M. College | | — |
| Wilson, M. O., M.B. | Curragh | Anæsthetist | — |
| Wells, A. G. | R.A.M. College | On probation | — |
| Worthington, F. | „ „ | „ | — |
| Walker, S. G., M.B. | „ „ | „ | — |

## MEDICAL OFFICERS OF THE HOUSEHOLD CAVALRY.

| Rank. | Name. | Regiment. | Station. | Specialist Certificates in |
|---|---|---|---|---|
| Surg.-Lieutenant-Colonel | Deeble, B. W. C. | 1st Life Guards | Hyde Park | — |
| Surgeon-Major | Power, J. H. | 2nd Life Guards | Windsor | — |
| ,, ,, | Pares, B. | Royal Horse Guards | Regent's Park | — |
| Surgeon-Captain | Cowie, R. M. | 2nd Life Guards | Windsor | — |
| ,, ,, | Bodington, P. J., M.B. | Royal Horse Guards | Regent's Park | — |
| ,, ,, | Lupton, A. C., M.B. | 1st Life Guards | Hyde Park | — |

## MEDICAL OFFICERS OF THE BRIGADE OF GUARDS.

| Rank. | Name. | Regiment. | Station. | Specialist Certificates in |
|---|---|---|---|---|
| Brig.-Surg.-Lieut.-Col. (Brevet-Colonel) | Harrison, C. E., M.B., F.R.C.S Eng., K.H.S. | Grenadier Guards | Millbank, London | — |
| Surg.-Lieutenant-Colonel | Crooke-Lawless, W. R., M.D , C.I.E. | Coldstream Guards | On Staff of Viceroy of India | — |
| ,, ,, ,, | Bateson, J. F., M.B. | ,, ,, | Windsor | — |
| Surgeon-Major | Moores, S. G. | Scots Guards | Aldershot | b. |
| ,, ,, | Whiston, P. H. | Irish Guards | Caterham | b. |

## QUARTERMASTERS.

| Rank | Name. | Dates of Birth. | Dates of Promotion to present rank. | Present Station. | Date of last arrival home or embarkation for Abroad. |
|---|---|---|---|---|---|
| Hon. Major | Merritt, G. | 23 6 1856 | 10 7 1889 | Cape Town, S. Africa | 24 12 1904 |
| | | | Hon. Major 10 7 1904 | | |
| ,, ,, | Beach, J. H. W. | 9 9 1857 | 8 1 1890 | London | 2 5 1903 |
| | | | ,, ,, 8 1 1905 | | |
| ,, ,, | Hirst, J. | 23 2 1856 | 4 2 1891 | Cosham | 31 8 1902 |
| | | | ,, ,, 4 2 1906 | | |
| ,, ,, | Goater, B. | 9 10 1854 | 23 12 1891 | Liverpool | 5 7 1903 |
| | | | ,, ,, 23 12 1906 | | |
| ,, ,, | Lockhart, H. | 6 8 1853 | 16 3 1892 | Exeter | 24 5 1903 |
| | | | ,, ,, 16 3 1907 | | |
| ,, Capt. | Lines, E. | 16 5 1855 | 4 10 1893 | Curragh | 21 10 1907 |
| | | | Hon. Capt. 4 10 1903 | | |
| ,, ,, | Crawley, C. | 7 5 1855 | 8 8 1894 | Egypt | 15 5 1903 |
| | | | ,, ,, 8 8 1904 | | |
| ,, ,, | Brake, T. F. | 18 2 1859 | 5 9 1894 | Dublin | 23 5 1902 |
| | | | ,, ,, 5 9 1904 | | |
| ,, ,, | Short, J. B. | 13 2 1860 | 12 9 1894 | London | 13 6 1907 |
| | | | ,, , 29 11 1900 | | |
| ,, ,, | Hasell, H. G. | 23 8 1860 | 17 4 1895 | Woolwich | 14 12 1902 |
| | | | ,, ,, 17 4 1905 | | |
| ,, ,, | Allen, G. L. | 25 5 1856 | 9 6 1897 | Ireland | 9 3 1908 |
| | | | ,, ,, 9 6 1907 | | |
| ,, ,, | Bruce, A. | 4 8 1858 | 24 11 1897 | Woolwich | 13 2 1904 |
| | | | ,, ,, 22 8 1902 | | |
| ,, Lieut. | Macintosh, P. | 12 10 1854 | 24 8 1898 | Edinburgh | 13 9 1902 |
| ,, ,, | Hawkey, R. | 12 9 1854 | 28 12 1898 | Birmingham | 16 11 1902 |
| ,, ,, | Whitehorn, J.C.B. | 27 2 1856 | 8 3 1899 | Cork | 24 3 1903 |
| ,, ,, | Painton, G. H. | 5 7 1855 | 24 6 1899 | Depôt | 10 9 1902 |
| ,, ,, | Brook, H. S. | 18 7 1856 | 12 7 1899 | S. Africa | 22 9 1899 |
| ,, ,, | Spackman, H. | 11 6 1860 | 4 10 1899 | S. Africa | 17 11 1905 |
| ,, ,, | Chalk, A. J. | 1 3 1861 | 18 11 1899 | Chatham | 23 11 1902 |

| Rank. | Name. | Dates of | | Present Station. | Date of last arrival home or embarkation for Abroad. |
|---|---|---|---|---|---|
| | | Birth. | Promotion to present rank. | | |
| Hon. Lieut. | Green, J. | 23 12 1859 | 18 11 1899 | Malta | 19 2 1908 |
| ,, ,, | Talbot, W. J. C. | 25 10 1857 | 18 11 1899 | York | 28 12 1902 |
| ,, ,, | Moss, E. P. | 11 4 1859 | 18 11 1899 | Southampton | 28 9 1905 |
| ,, ,, | Essex, B. E. | 2 6 1860 | 6 12 1899 | Egypt | 8 1 1907 |
| ,, ,, | McClay, J. | 20 9 1858 | 6 12 1899 | Woolwich | 31 1 1905 |
| ,, ,, | Short, G. F. | 5 4 1862 | 6 12 1899 | Dublin | 11 3 1908 |
| ,, ,, | Woolley, H. | 28 1 1864 | 13 12 1899 | Dover | 9 3 1908 |
| ,, ,, | Glennon, J. | 10 6 1859 | 13 12 1899 | Hong Hong | 31 10 1907 |
| ,, ,, | Hall, F. W. | 26 4 1859 | 3 1 1900 | Aldershot | 7 12 1902 |
| ,, ,, | Morrison, A. | 16 5 1860 | 3 1 1900 | Malta | 24 9 1907 |
| ,, ,, | Attwood, J. | 16 12 1862 | 24 1 1900 | Cosham | 13 12 1902 |
| ,, ,, | Duncan, W. | 22 4 1859 | 24 1 1900 | Netley | 18 9 1902 |
| ,, ,, | [1]Bruce, F. | 29 1 1859 | 3 2 1900 | Dublin | 19 11 1900 |
| ,, ,, | Holway, W. G. | 8 11 1859 | 3 2 1900 | Wynburg, S. Africa | 22 9 1904 |
| ,, ,, | Offord, E. P. | 3 5 1862 | 3 2 1900 | Gibraltar | 13 2 1908 |
| ,, ,, | Audus, H. J. F. | 17 6 1860 | 3 2 1900 | Aldershot | 11 3 1900 |
| ,, ,, | Conolly, J. B. | 7 8 1864 | 7 3 1900 | S. Africa | 27 11 1907 |
| ,, ,, | Houghton, E. | 17 6 1859 | 17 3 1900 | Belfast | 7 12 1902 |
| ,, ,, | Scott, R. | 5 11 1859 | 17 3 1900 | Netley | 21 10 1907 |
| ,, ,, | Wilson, A. | 15 9 1864 | 17 3 1900 | Devonport | 29 1 1908 |
| ,, ,, | Glover, H. W. | 10 2 1860 | 17 3 1900 | Aldershot | 6 5 1901 |
| ,, ,, | Exton, T. | 11 8 1860 | 23 5 1900 | ,, | 30 8 1902 |
| ,, Captain | Crookes, F. | 26 11 1861 | 23 5 1900<br>Hon. Capt. 29 11 1900 | Devonport | 10 12 1904 |
| ,, Lieut. | Cowan, R. R. | 29 5 1862 | 30 5 1900 | Shorncliffe | 19 12 1903 |
| ,, ,, | Benson, G. A. | 19 12 1862 | 2 6 1900 | N. China | 31 10 1907 |
| ,, ,, | Jacomb, T. J. | 16 4 1861 | 2 6 1900 | S. Africa | 14 7 1906 |
| ,, ,, | Wakefield, H. P. | 11 2 1862 | 23 6 1900 | Tidworth | 16 4 1905 |
| ,, ,, | Wheeler, A. | 1 4 1862 | 23 6 1900 | Depôt | 10 2 1905 |
| ,, ,, | Pilgrim, A. J. | 28 6 1860 | 15 8 1900 | Malta | 24 9 1907 |
| ,, ,, | Lunney, A. | 7 1 1864 | 16 2 1901 | Tidworth | 10 2 1905 |
| ,, ,, | Clapshaw, A. | 3 9 1859 | 13 3 1901 | Edinburgh | 2 10 1902 |
| ,, ,, | Archibald, W. N. | 8 9 1861 | 13 3 1901 | Colchester | 14 2 1908 |
| ,, ,, | Watkins, J. | 29 5 1860 | 13 3 1901 | Chester | 16 4 1905 |
| ,, ,, | Gillman, J. | 28 11 1862 | 11 1 1902 | Netley | 16 4 1905 |
| ,, ,, | Cope, T. F. | 14 11 1861 | 11 1 1902 | Pretoria, S. Africa | 21 9 1904 |
| ,, ,, | Osborne, J. W. | 18 2 1865 | 18 3 1908 | South Africa | 27 5 1895 |

## RETIRED MEDICAL OFFICERS OF THE REGULAR ARMY WHO ARE EMPLOYED.

| Name. | Station where Employed. |
|---|---|
| Col. B. B. Conolly, C.B., M.D. | London. |
| Lieut.-Col. W. O'B. White (Hon. Brig.-Surg.) | Tralee. |
| Lieut.-Col. W. H. Steele, M.D. | Clifton, Bristol. |
| Lieut.-Col. W. C. Gasteen, M.B. | Seaforth. |
| Lieut.-Col. R. H. Robinson | Guernsey. |
| Lieut.-Col. J. D. Crowe (Hon. Brig.-Surg.) | Weymouth. |
| Lieut.-Col. H. H. Stokes, M.D. | Oxford. |
| Capt. H. Cotton | Ipswich. |
| Lieut.-Col. J. G. Williamson | Leicester. |
| Lieut.-Col. J. Coats, M.B. | Ayr. |
| Lieut.-Col. W. M. James | School of Musketry, Hythe. |
| Lieut.-Col. J. A. Gormley, M.D. | Kingston. |

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[1] Specialist Certificate in Skiagraphy.

| Name. | Station where Employed. |
|---|---|
| Col. A. L. Browne, M.D. | Taunton. |
| Lieut.-Col. H. Scott, M.B. | London. |
| Lieut.-Col. J. Hoysted | Derby. |
| Col. W. A. Parker | Penally. |
| Major P. Connolly | Belfast. |
| Lieut.-Col. L. B. Ward | Coventry. |
| Lieut.-Col. W. Finlay | Jersey. |
| Lieut.-Col. H. Charlesworth, C.M.G. | London. |
| Lieut.-Col. G. F. Poynder | Bedford. |
| Major P. G. Ievers | Fort Staddon. |
| Lieut.-Col. J. Tidbury, M.D. | Royal Military College. |
| Lieut.-Col. L. Haywood, M.B. | Detention Barracks, Aldershot. |
| Major J. F. Burke | Lancaster. |
| Lieut.-Col. T. B. A. Tuckey | Detention Barracks, York. |
| Lieut.-Col. W. G. Clements | Christchurch. |
| Lieut.-Col. A. Baird, M.B. | Worcester. |
| Lieut.-Col. J. Riordan, M.B. | Clonmel. |
| Lieut.-Col. J. T. Carey, M.B. | Manchester. |
| Major E. H. Myles, M.B. | Guernsey. |
| Surg.-Lieut.-Col. G. S. Robinson | Eastbourne. |
| Major S. Butterworth | Carlisle. |
| Lieut.-Col. G. T. Trewman | Reading. |
| Lieut.-Col. J. Osburne | Galway. |
| Lieut.-Col. E. M. Wilson, C.B., C.M.G., D.S.O. | Record Office, Aldershot. |
| Major A. E. C. Spence, M.B. | Warwick. |
| Major B. F. Zimmermann | Topsham, Exeter. |
| Major R. J. McCormack, M.D. | Omagh. |
| Lieut.-Col. T. A. Dixon, M.D. | Maidstone. |
| Major R. I. Power | Waterford. |
| Lieut.-Col. T. Archer | Lydd. |
| Lieut.-Col. U. J. Bourke, M.B. | Hamilton. |
| Lieut.-Col. G. E. Moffet, M.B. | Perth. |
| Lieut.-Col. F. J. Greig | Stirling. |
| Lieut.-Col. J. Kearney, M.D. | Wrexham. |
| Major J. P. S. Hayes | Gravesend. |
| Major J. W. F. Long | Military Prison, Dover. |
| Lieut.-Col. T. H. Corkery | Exeter. |
| Lieut.-Col. R. W. Barnes | Dorchester. |
| Lieut.-Col. M. J. Whitty, M.D. | Liverpool. |
| Lieut.-Col. C. J. W. Tatham | Scarborough. |
| Lieut.-Col. J. R. Mallins, M.B. | Detention Barracks, Gosport. |
| Lieut.-Col. J. M. Nicolls, M.B. | ,, ,, Cork. |
| Lieut.-Col. A. de C. Scanlan | ,, ,, Woking. |
| Lieut.-Col. W. S. Dowman | ,, ,, Cork. |
| Major G. A. Wade | Horfield. |
| Capt. J. T. Clapham | Landguard Fort. |
| Major C. W. Allport, M.D. | Great Yarmouth. |
| Lieut.-Col. C. R. Woods, M.D. | Detention Barracks, Dublin. |
| Major A. Wright | Falmouth. |
| Lieut.-Col. A. W. Browne | Armagh. |
| Major V. H. W. Davoren | Bury St. Edmunds. |
| Major H. V. Dillon | Trowbridge. |
| Lieut.-Col. A. Hosie | Sandown. |
| Major J. D. Moir | Fort Efford and Mutley District. |
| Lieut.-Col. G. Coutts | Chichester. |
| Lieut.-Col. W. J. MacNamara | Dublin. |

# JOURNAL

OF THE

# ROYAL ARMY MEDICAL CORPS.

## Corps News.

JULY, 1908.

### ARMY MEDICAL SERVICE.—GAZETTE NOTIFICATIONS.

Surgeon-General William J. Fawcett, C.B., M.B., is placed on retired pay, dated May 13, 1908. He entered the Service April 1, 1871; was promoted Surgeon, Army Medical Department, March 1, 1873; Surgeon-Major, Army Medical Department, April 1, 1883; Surgeon-Lieutenant-Colonel, Army Medical Service, April 1, 1891; Brigade-Surgeon-Lieutenant-Colonel, Army Medical Service, April 24, 1895; Colonel, Royal Army Medical Corps, May 10, 1899; Surgeon-General on temporary augmentation, April 1, 1903; Deputy-Director-General, Army Medical Service, January 20, 1905. His war services are as follows: Soudan Expedition, 1885.—Suakin. Medal with clasp, bronze star. Hazara Expedition, 1888. Mentioned in despatches. Medal with clasp.

Colonel Arthur T. Sloggett, C.M.G., to be Surgeon-General, *vice* W. J. Fawcett, C.B., M.B., dated May 13, 1908.

Colonel George D. N. Leake is placed on retired pay, dated May 17, 1908. He entered the Service April 1, 1871; was promoted Surgeon, Army Medical Department, March 1, 1873; Surgeon-Major, April 1, 1883; Surgeon-Lieutenant-Colonel, Medical Staff, April 1, 1891; Brigade-Surgeon-Lieutenant-Colonel, October 3, 1895; Colonel, Royal Army Medical Corps, November 6, 1900. His war services are as follows: South African War, 1879. Medal. Burmese Expedition, 1885-7. Medal with clasp.

Lieutenant-Colonel and Brevet-Colonel David Bruce, C.B., M.B., from the Royal Army Medical Corps, to be Colonel, *vice* G. D. N. Leake, dated May 17, 1908.

Colonel William Babtie, V.C., C.M.G., M.B., from Supernumerary to Establishment, to be Colonel, *vice* A. T Sloggett, C.M.G., promoted, dated April 13, 1908. The transfer from the Supernumerary List of Colonel W. Babtie, V.C., C.M.G., bears date May 13, 1908, instead of as notified in the *Gazette* of May 22, 1908.

Surgeon-General Richard H. Quill, M.B., is placed on retired pay, dated June 8, 1908. He entered the Service March 30, 1872; was promoted Surgeon, Army Medical Department, March 1, 1873; Surgeon-Major, Army Medical Department, March 30, 1884; Surgeon Lieutenant-Colonel, Medical Staff, March 30, 1892; Brigade-Surgeon-Lieutenant Colonel, Army Medical Service, June 30, 1896; Colonel, Royal Army Medical Corps, March 16, 1902; Surgeon-General, Army Medical Service, April 22, 1905. His war services are as follows: Afghan War, 1878-80.—With Kuram Field Force, Zaimusht Expedition. Medal.

### ROYAL ARMY MEDICAL CORPS.

Lieutenant James C. L. Hingston is confirmed in that rank.

**ARRIVALS HOME ON LEAVE.**—From India: Lieutenant-Colonels A. E. Morris, H. B. Mathias, D.S.O., G. F. Gubbin; Major R. C. Thacker; Captain W. D. C. Kelly. From Egypt: Lieutenant Colonels W. J. Baker and J.B. Wilson; Major C. K. Morgan; Lieutenant J. H. Graham. From Gibraltar: Captain E. W. P. V. Marriott.

**EXCHANGES.**—Lieutenant-Colonels M. W. Russell and N. Manders; Majors A. J. Chambers and E. W. Bliss; J. Girvin and N. Marder; C. E. G. Stalkartt and M. Swabey; A. C. Fox and D. Lawson; Captains J. J. W. Prescott, D.S.O., and A. H. Safford.

**SELECTIONS FOR INCREASED PAY.**—Lieutenant-Colonels F. H. M. Burton, C. E. Nichol, D.S.O., S. Westcott, C.M.G., and B. M. Skinner, M.V.O., have been selected for increased pay of that rank.

**EMBARKATIONS.**—For South Africa: Colonel G. W. Robinson. For India: Lieutenant-Colonels R. S. F. Henderson and L. E. Anderson. For Malta: Major C. M. Fleury (from sick leave). For Gibraltar: Lieutenant J. H. Spencer. For West Coast of Africa: Captains J. Powell and N. J. C. Rutherford.

**TRANSFERS.**—Major E. T. F. Birrell and Captain L. W. Harrison, M.B., from Aldershot to London District. Captain G. G. Delap, D.S.O., from London District to Aldershot. Lieutenant A. Fortescue, from London District to Southern Command.

**POSTING.**—Captain H. J. McGrigor to Western Command.

**DIPLOMAS.**—Captain E. P. Sewell obtained the D.P.H. Cambridge. Major R. J. Blackham has qualified as a barrister-at-law.

**APPOINTMENTS.**—Captain H. C. R. Hime, M.B., as Adjutant, Depôt, Royal Army Medical Corps, Aldershot; Captain G. G. Delap, as Assistant Instructor, Royal Army Medical Corps School of Instruction; Captains L. W. Harrison, M.B., and J. C. Kennedy as Clinical Assistants at Queen Alexandra Military Hospital, Millbank.

The undermentioned officers have been appointed Adjutants of the Schools of Instruction, R.A.M.C., Territorial Force:—

| Names | Divisions | Location |
|---|---|---|
| Captain J. M. Sloan, D.S.O., M.B. .. | Highland .. .. .. | Aberdeen. |
| Major A. J. MacDougall, M.B. .. | Lowland .. .. .. | Glasgow. |
| Captain H. P. W. Barrow .. .. | East and West Lancashire.. | Manchester. |
| ,, E. P. Connolly .. .. | Welsh .. .. .. .. | Cardiff. |
| ,, H. S. Roch .. .. .. | W. Riding and Northumbria | Leeds. |
| ,, E. Bennett .. .. .. | North Midland .. .. | Wolverhampton. |
| ,, F. A. Stephens .. .. | South Midland .. .. | Birmingham. |
| ,, R. H. Lloyd .. .. .. | Wessex.. .. .. .. | Exeter. |
| ,, W. A. Woodside .. .. | East Anglian .. .. .. | Ipswich. |
| ,, L. N. Lloyd, D.S.O. .. | Home Counties .. .. | Maidstone. |
| ,, E. T. Inkson, V.C. .. .. | 1st and 2nd London.. .. | London. |

*Medal.*—Lieutenant-Colonel W. G. Macpherson, C.M.G., Royal Army Medical Corps, has had the medal for Meritorious Service conferred on him by the Japanese Red Cross Society.

*Languages.*—Lieutenant A. Fortescue, Royal Army Medical Corps, passed in French at the examination held in April, 1908.

## MENTIONED IN DESPATCHES, "LONDON GAZETTE," APRIL 22, 1908.

Lieutenant-Colonel M. W. Kerin, Royal Army Medical Corps, as having done extra good work during the operations with the Bazar Valley Field Force in February and March, 1908.

**QUARTERMASTERS.**—Quartermaster and Honorary Lieutenant G. F. Short has been posted to the Royal Infirmary, Dublin, for duty.

Quartermaster and Honorary Lieutenant A. Clapshaw has been transferred to Edinburgh for duty.

Quartermaster and Honorary Lieutenant A. J. Chalk has been transferred to Chatham for duty.

## DISTRIBUTION OF THE LIEUTENANTS ON PROBATION, ROYAL ARMY MEDICAL CORPS, 1st JUNIOR COURSE, 1908.

| Rank and Name | Command | Rank and Name | Command |
|---|---|---|---|
| Lieut. A. L. Foster | Aldershot | Lieut. M. Leckie | Eastern |
| ,, T. F. Lumb | ,, | ,, J. James | ,, |
| ,, R. O'Kelly | ,, | ,, C. M. Rigby | ,, |
| ,, W. J. Tobin | ,, | ,, A. C. H. Suhr | ,, |
| ,, A. H. T. Davis | Northern | ,, A. G. Wells | ,, |
| ,, A. Shepherd | ,, | ,, F. Worthington | ,, |
| ,, J. E. Ellcombe | Southern | ,, F. H. Bradley | Western |
| ,, A. E. G. Fraser | ,, | ,, J. R. Lloyd | ,, |
| ,, L. Murphy | ,, | ,, H. H. Blake | Scottish |
| ,, B. Varvill | ,, | ,, R. M. Dickson | ,, |
| ,, C. Cassidy | Netley | ,, T. S. Eves | Irish |
| ,, F. B Dalgliesh | ,, | ,, J. F. Grant | ,, |
| ,, C. E. L. Harding | ,, | ,, J. W. Houston | ,, |
| ,, G. J. Keane | ,, | ,, F. M. Hewson | ,, |
| ,, J. S. McCombe | ,, | ,, C. McQueen | ,, |
| ,, W. H. S. Burney | Eastern | ,, C. P. O Brien-Butler | ,, |
| ,, W. J. Dunn | ,, | ,, A. L. Stevenson | ,, |

### LIST OF CASUALTIES:—

*Discharges.*—7658 Serjeant-Major W. F. Watterton, May 16, 1908, to pension; 7429 Staff-Serjeant G. W. Quarrington, May 14, 1908, after three months notice; 9795 Corporal J F. Turner, May 14, 1908, medically unfit; 7902 Corporal J. E. Stevenson, May 18, 1908, termination of second period; 18338 Corporal G. F Cartwright, May 11, 1908, purchase; 6762 Serjeant-Major B. G. Brook, June 10, 1908, to pension; 7726 Quartermaster Serjeant W. H. Scrase, June 13, 1908, termination of second period; 7538 Private G. T Dally, May 14, 1908. medically unfit; 1809 Private C. C. Hooker, May 16, 1908, free after twelve years: 7762 Private J. Ward, May 24, 1908, termination of second period; 9830 Private H. Grossheim, June 4, 1908, free after fifteen years; 7786 Private W. Stevenson, June 6, 1908, termination of second period; 1384 Private J. H. Bailey, June 9, 1908, on payment of £18; 19183 Private S. Millwood, June 9, 1908, on payment of £25.

*Transferred to Army Reserve.*—15697 Private F. Barker, May 15, 1908; 14171 Private F. A. Nunn, May 15, 1908; 15073 Private J. H. Sampford, May 10, 1908; 19614 Private P. Smyth, May 11, 1908; 15707 Private C Sparkes, May 14, 1908; 14298 Private S. J. Light, May 14, 1908; 14182 Private A W. Bennett, May 17, 1908; 19613 Private W. F. Armstrong, May 17, 1908; 14346 Private J. W. Crick, May 21, 1908; 18591 Private F. Moss, May 24, 1908; 19548 Private C. Philips, May 24, 1908; 14247 Private F. Williams, May 28, 1908; 14215 Private G Fraser, May 24, 1908, 14282 Private C. Cull, June 4, 1908; 19632 Private N. W. Hawke, June 5, 1908; 19636 Private B. Barnacott, June 6, 1908; 14283 Private J. E. Hawley, June 4, 1908; 19633 Private W. C. Fisher, June 4, 1908.

*Transfers from other Corps.*—17287 Serjeant W. Stevens, May 21, 1908, from Scottish Border, R.A.M.C., Vols.; 10005 Serjeant W. T. Hughes, May 18, 1908, from Dublin Company, R.A M.C., Militia; 1822 Private J. E. Hancliff, May 11, 1908, from Royal Engineers; 1830 Private T. E. Burr, February 27, 1908, from Royal Marines; 1831 Private S. T. Riley, May 1, 1908, from Argyll and Sutherland Highlanders; 1832 Private H Judd, May 15, 1908, from King's Royal Rifles.

*Transfers to other Corps.*—1803 Private A. Mortimer, May 13, 1908, to 1st Gordon Highlanders; 1446 Private A. Tickner, May 28, 1908, to 5th Lancers; 1003 Private F. Bamberger, May 26, 1908, to Royal Horse Artillery.

*Promotions.*—8954 Quartermaster-Serjeant T. Grenfell, May 17, 1908, to be Serjeant-Major, *vice* Watterton to pension.

*Embarkations for Abroad.*—10445 Serjeant E. Haynes, May 23, 1908, to Singapore.

### THE FOLLOWING N.C.O.'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Staff-Serjeants.*—11450 Serjeant A. H. Owens, 9205 Serjeant F. Judd.

*For Serjeants.*—9903 Serjeant R. T. Pack, 18158 Corporal G. P Pursey, 12588 Lance-Serjeant J. Meason, 10059 Staff Serjeant G. W. Carnell, 10522 Lance-Serjeant A. Holloman, 11896 Corporal A. P. Spackman.

*For Corporal.*—17825 Private N. Moore, 12071 Private C. Everett, 11492 Private H. W. Stoner, 17977 Private D. Davis, 11391 Private G. C. Maidment, 16432 Private J. A. White, 10076 Corporal W. H. Brown, 11015 Private W. E. Phillips, 470 Private H. A. Claridge, 19938 Private A. E. Wright, 15804 Private J. Fitze, 16154 Private W. Sunderland, 18743 Private H. Warrod.

### The Following is the Result of the Examination for First-class Certificates of Education held on March 31, 1908.

*Awarded Certificates.*—15096 Serjeant J. E. Pugh, 12522 Serjeant S. P. Gallie, 586 Private W. A. Gordon, 751 Private A. J. Milne, 18988 Private R. H. T. Haigh, 19192 Private F. Poole, 391 Private W. J. Scorey, 19876 Private A. Thompson, 19980 Private H. J. Loder, 9691 Staff-Serjeant G. Arnold, 18385 Corporal F. W. Coupland, 14926 Serjeant W. H. G. Hunt, 19543 Private F. Andus, 874 Private F. A. Johnson, 19282 Private H. Golden, 10106 Serjeant E. Gooding, 11816 Serjeant L. A. Shepherd, 8311 Staff-Serjeant A. Ward, 16573 Serjeant R. S Nichol, 14663 Serjeant P. Snow, 8836 Staff-Serjeant G.W. Petch, 17500 Corporal R. R. White, 10162 Staff-Serjeant C. Drury, 16301 Serjeant E. A. Lane, 19933 Private W. C. Savegar, 18403 Corporal K. Mayell, 19555 Private P. C. Martin, 18777 Private W. Aylett, 8268 Staff-Serjeant G. B. Walker, 19924 Private E. D. Barr, 9248 Staff-Serjeant A. C. Truman.

*Passed in Group I.*—14008 Serjeant D. Watt, 1292 Private H. G. Hall, 1032 Private E. Moan, 11627 Serjeant H. Secker, 18903 Private A. Malo, 19102 Private H. C. Hughes.

*Passed in Group II.*—9940 Staff-Serjeant F. Davis, 13317 Serjeant C. F. Wheeler, 18578 Private J. W. Darlington, 19884 Private F. Hort, 12056 Serjeant E. Winton, 10880 Serjeant L. T. Fitzgerald, 11582 Serjeant J. Ryan, 11613 Serjeant G. R. Morris.

## LIST OF SUCCESSFUL CANDIDATES IN THE RECENT EXAMINATION FOR ARMY FORM C. 344, CERTIFICATE OF TRAINING AS A NURSE, HELD IN MAY, 1908 (HOME STATIONS).

| Corps No. | Rank and name | Company | Percentage of marks | Remarks. No. of candidates |
|---|---|---|---|---|
| 18157 | Private A. Pruden | 10 | 83 | 1 |
| 19001 | ,, J. Barritt | 14 | 82 | 2 |
| 19086 | ,, A. Wain | Aldershot | 81 | 3 |
| 19862 | ,, L. R. Tole | ,, | 81 | 4 |
| 17747 | ,, F. J. Vine | ,, | 78 | 5 |
| 18748 | ,, W. Cummings | 18 | 78 | 6 |
| 18648 | ,, J. B. Haley | Woolwich | 78 | 7 |
| 19460 | ,, C. J. T. Payne | 18 | 77 | 8 |
| 16352 | ,, A. B. Court | Netley | 77 | 9 |
| 19541 | ,, F. May | Aldershot | 75 | 10 |
| 14603 | ,, C. J. File | 9 | 73 | 11 |
| 19249 | ,, J. Caste | Netley | 73 | 12 |
| 19202 | ,, F. J. R. Baiden | 7 | 72 | 13 |
| 15737 | Lance-Corpl. A. E. Thompson | Netley | 72 | 14 |
| 14391 | Private G. Boden | 18 | 71 | 15 |
| 19792 | ,, H. A. Baigent | Aldershot | 71 | 16 |
| 15538 | Lance-Corpl. E. H. Jesson | 18 | 70 | 17 |
| 18815 | Private H. Milsom | 18 | 70 | 18 |
| 19857 | ,, H. Cooper | 18 | 70 | 19 |
| 19669 | ,, T. Joyce | 18 | 69 | 20 |
| 19670 | ,, T. H. Potter | Netley | 69 | |
| 12413 | ,, E. J. Russell | 18 | 67 | 21 |
| 17776 | Corporal W. Milliken | Aldershot | 66 | 22 |
| 14880 | Private M. Farren | 9 | 66 | |
| 18725 | ,, I. Loweth | 10 | 66 | |
| 17091 | ,, J. Moore | Aldershot | 65 | 23 |
| 15861 | Lance-Corpl. J. Hindle | 11 | 65 | 24 |
| 19543 | Private F. E. H. Audus | Woolwich | 62 | 25 |
| 18427 | ,, P. Barber | 11 | 60 | 26 |

# ROYAL ARMY MEDICAL CORPS, ANNUAL DINNER, 1908.

THE Officers', R.A.M.C., Annual Corps Dinner took place at the Trocadero Restaurant on Monday, June 15, 1908 (Monday in Ascot week being the day fixed for this annual gathering). Sir Alfred Keogh, K.C.B., K.H.P., was in the chair, and 215 past and present members of the Corps sat down to dinner. Mr. Vesey Holt (Agent for the Corps) was the only guest. The following officers were able to be present:—

*Surgeon-Generals.* Sir Alfred Keogh, K.C.B., K.H.P., Director-General A.M.S.; Sir William Taylor, K.C.B., K.H.P.; A. F. Bradshaw, C.B., K.H.P.; H. S. Muir, C.B.; T. Maunsell, C.B.; Sir Charles McD. Cuffe, K.C.B.; W. S. M. Price; W. F. Burnett; Sir T. J. Gallwey, K.C.M.G., C.B.; W. J. Fawcett, C.B.; J. D. Edge, C.B.; W. S. Pratt, C.B.; F. W. Trevor, C.B.; G. D. Bourke, C.B.; J. C. Dorman, C.M.G.; A. T. Sloggett, C.M.G.

*Deputy Surgeon-Generals:* W. G. Don; J. H. Jeffcoat.

*Colonels:* W. Babtie, V.C., C.M.G.; J. M. Beamish; A. L. Brown; D. Bruce, C.B., F.R S.; T. M. Corker; A. E. J. Croly; G. T. Coggin; C. E. Harrison, K.H.P.; W. Johnston, C.B., T. F. MacNeece; J. Maturin; J. Magill, C.B.; W. A May, C.B.; W. J. Rainsford, C.I E.; S. K. Ray; J. I. Routh; D. Wardrop; C. A. Webb.

*Lieutenant-Colonels:* A. R. Aldridge; H. J. Barratt; H. J. Barnes; W. G. A. Bedford, C.M.G.; R. P. Bond; J. P. H. Boileau; U. J. Bourke; A. Clarke; T. H. F. Clarkson; R. C. Cottell; H. E. Cree; J. J. Crean; J. H Curtis; J. S. Davidson; A. M. Davies; W. Dick; A. Dodd, J. R. Dodd; W. Dowman; E. Eckersley; White Esmonde; C E. Faunce; Sir J. Fayrer, Bart.; R. H Firth; H. J. Fletcher; C. Garner; R. J. Geddes, D.S O.; J. A. Gormley; F. J. Greig; R. H. Hall; H. G. Hathaway; F. W. H. D. Harris; R. I. D. Hackett; L. Haywood; J. M. Irwin; H. E. R. James; C. W. Johnson, R. Kirkpatrick, C.M G.; W. B. Leishman; C. J. Macdonald; W. G. Macpherson, C.M.G.; A. A. Macrobin; J. R. Mallins; H. B. Matthias, D S.O.; C. H. Melville; C. E. Nichol, D.S.O.; M. D. O'Connell; R. H. Penton, D.S.O.; S. Powell; C. C. Reilly; H. D. Rowan; W. Rowney; A. F. Russell, C.M.G.; M. W. Russell; D. M. Saunders; A. A. Sutton, D.S.O.; A. E Tate; H. N. Thompson, D.S.O.; H. O. Trevor; C. R. Tyrrell; E. O. Wight; E. M. Wilson, C.B., C.M.G., D.S.O., R W. Wright; H. J. Wyatt.

*Majors:* R. F. E. Austin; T. B. Beach; E. T. F. Birrell; G. W. Bray; H. A. Bray; E. G. Brown; H. J. M. Buist, D.S.O.; J. E. Carter; E. W. W. Cochrane; V. Davoren; C. R. Elliott; P. Evans; F. G. Fairchnie; J. D. Ferguson, D.S.O.; J. V. Forrest; H C. French; J. Girvin; S. F. Green, H. W. Grattan; W. L. Gray; F. E. Gunter; M. P. C. Holt, D.S.O.; W. H. Horrocks; C. B. Martin; J. R. McMunn; J. Moir; A. H. Morris; G. A. Moore; H. S. Peeke; H. I. Pocock; F. J. Porter, D.S.O.; G T. Rawnsley; C. T. Samman; L. F. Smith; C. G. Spencer; H E. Staddon; G. B. Stanistreet; C. Stonham, C.M.G.; F. A. Symons; A. G. Thompson; J. Thomson; H. C. Thurston, C.M.G.; H. S. Thurston; G. T. Trewman; A. F. Tyrrell; F. J. Wade Brown; B. F. Zimmerman.

*Captains:* F. Ashe; H. R. Bateman; R. T. Brown; H. Browne-Mason; H St. M. Carter; J. G. Churton; J. T. Clapham; T. H. M. Clarke; M. R. Corkery; J. Cowan; R. V. Cowey; C. C. Cumming; G. G. Delap, D.S.O.; H. E. M. Douglas, V.C., D.S.O.; A. C Duffey; R. F. Ellery; H. B. Fawcus; C. E. Fleming; J. G. Foster; W. B. Fry; R. S. H. Fuhrr, D.S.O.; C. H. Furnivall; W. R. P. Goodwin; A. R. Greenwood; A. E. Hamerton, D.S.O.; J. Hartigan; P. H. Henderson; H. C. R. Hime; H. E. J. A. Howley; G. W. G. Hughes; R. N. Hunt; E. F. Inkson, V.C.; C. Kennedy; M. M. Lowsley: J. McD. McCarthy; J. Matthews; H. S. Nickerson, V.C.; D. O'Connor; P. S. O'Reilly; L. E. L. Parker; F. M. Parry; H. Pinches; J. Poe; R. L. Popham; T. J. Potter; W. Riach; H. S. Roch; F. E. Rowan-Robinson; H. F. Shea; J. B. Short; S. W. Siberry; H. Simson; W. M. S. Sparkes; H. G. F. Stallard; G. E. F. Stammers; F. A. Stephens; A. H. Straton; W. J. Waters; A. L. Webb; A. O. B. Wroughton.

*Lieutenants:* M. P. Leahy, H. T. Treves.

*Surgeon-Colonel:* W. T. Martin.

*Brigade-Surgeon-Lieutenant-Colonels:* J. Ambrose; J. F. Beattie; W. J. Wilson.

*Surgeon-Lieutenant-Colonel:* C. R. Kilkelly.

*Surgeon-Majors:* S. Guise Moores; P. H. Whiston.

At the conclusion of the dinner the Chairman proposed the health of "His Majesty the King," and, subsequently, that of "Her Majesty Queen Alexandra, the Prince and Princess of Wales, and the other members of the Royal Family," which were duly honoured.

Sir Alfred Keogh then proposed the health of Major H. C. Thurston, C.M.G., who for four years had been Honorary Secretary of the Dinner Sub-Committee, and was now proceeding abroad. He felt certain that he was expressing the feelings of all his brother officers when he thanked Major Thurston for all the trouble he had taken in so successfully arranging the Annual Dinners.

Major Thurston, in reply, reminded those present that the Dinner Sub-Committee should have shared in the compliments so kindly expressed by the Director-General, and gave a brief sketch of the history of the Corps Dinner since its inception in 1881. The numbers dining have been as follows; 1881, 95; 1891, 85; 1901, 75 (South African War); 1905, 173; 1906, 189; 1907, 203; 1908, 215. He thanked the Chairman for the kind manner in which he had proposed his health, and his brother officers for the hearty manner in which they responded to the toast.

Mr. Geo. P. Robertson (Bandmaster, R.A.M.C.), with selected instrumentalists from the Corps Band, was in attendance, and the following selection of music was much appreciated:—

| | | | |
|---|---|---|---|
| 1. | MARCH | From "Prodana Nevesta" | *Smetana.* |
| 2. | GAVOTTE | "Floreal" | *Hyder.* |
| 3. | SELECTION | "The Mikado" | *Sullivan.* |
| 4. | INTERMEZZO | "The Broken Melody" | *Van Biene.* |
| 5. | WALZER | "Schauzel Lied" | *Hollaender.* |
| 6. | MARCH of the "Mountain Gnomes" | | *Euenberg.* |
| 7. | POTPOURRI | "Boccaccio" | *Suppe.* |
| 8. | SERENATA | | *Moszkowski.* |
| 9. | WALZER | "Walzerstraüme" | *Oscar Straus.* |
| 10. | SERENADE | "De Mandolines" | *Desormes.* |

As in past years, the messes at Aldershot and the Royal Army Medical College kindly lent selections of silver plate for the tables, and these, with the floral decorations, chiefly roses, presented a most tasteful appearance.

**NOTES FROM ALDERSHOT.**—Lieutenant-Colonel H. O. Trevor, R.A.M.C., writes (June 2, 1908): "We have been busy here since the commencement of the year in becoming familiar with the working of the field ambulance and general medical work in the field. No. 1 Field Ambulance was completely mobilised from January 27 to 31, the reservists being represented by recruits of the Scottish Rifles. Much useful information was gained in the methods of drawing and handling equipment, &c., the entire procedure on mobilisation being carried out. On two days field operations were carried out under the supervision of Sir Thomas Gallwey, P.M.O., and in the presence of several General and Staff officers. Since then a section of a field ambulance has been periodically mobilised, so that all ranks have had an opportunity of becoming familiar with its working. Two very interesting staff tours for officers of the Royal Army Medical Corps were carried out under the direction of Sir Thomas Galwey, P.M.O., one in the neighbourhood of Cambridge, and the other near the Sussex coast; these tours were attended by senior officers, who gained an excellent opportunity of increasing their knowledge. During the month of May, Aldershot was visited by their Majesties the King and Queen, who witnessed some practical work by the Corps, including the use of the new water-cart. Their Majesties also visited the Louise Margaret Hospital. Their Royal Highnesses the Prince and Princess of Wales also paid a visit to the Connaught Hospital. The Corps was at Home during the Aldershot Races. On the second day the proceedings were somewhat marred by the heavy rain.

"There have been many changes of late amongst the officers; Lieutenant-Colonel Irvine and Captain and Quartermaster Finley have been placed on retired pay, Lieutenant-Colonel Rowney has relieved Lieutenant-Colonel Moberley of the charge of the Connaught Hospital, the latter going to Burmah. Lieutenant-Colonel L. E. Anderson, has left, to the regret of all, to take up an administrative post in India, the charge of the Cambridge Hospital devolving on Lieutenant-Colonel H. N. Thompson. Major Birrell, the Adjutant of the Depôt, has left, relieving Major Thurston at the War Office. During the ensuing reliefs many further changes are to take place."

**NOTES FROM COLABA, INDIA.**—Major H. E. Winter, R.A.M.C., writes (May 30, 1908): "Great honour has been done to the Corps in Colonel Forman being elected The Most Worshipful, The Grand Master of all Scottish Freemasonry in India. His few immediate predecessors were Lords Lamington, Northcote, and Sandhurst, and H.R.H. the Duke of Connaught. Colonel Forman is a staunch Freemason, and we are all confident he will fill the post and uphold the cause equally with his immediate brilliant predecessors.

"Captain J. G. Berne, R.A.M.C., in charge of Bombay Brigade Laboratory, is home on leave, and Captain D. O. Hyde, R.A.M.C., is acting for him, and is also in medical charge of the 116th Mahrattas and Staff and Details, Bombay, in addition to his other duties at the Station Hospital, Colaba, Major Whitcombe, I.M.S., having been sent on field service. Captain J. Fairbairn, R.A.M.C., is in medical charge of the 2nd Royal Scots, Colaba, the surgical and venereal wards at the Station Hospital, Colaba, and the Station Family Hospital.

"There is every likelihood, due entirely to Colonel Forman, that in the immediate future the allotment of invalids will be carried out by the Principal Medical Officers, Bombay and Karachi, and I have no doubt that much unnecessary suffering will be saved by this, and I speak from an experience of three years as Embarking Medical Officer, Bombay Brigade.

"An addition is being made to the Station Hospital, Colaba, viz., an operating theatre, and it is almost completed. This will bring this excellent institution up to a standard which will compare favourably with any hospital in India. I may mention that our hospital was classed last year amongst the various sanatoria in India, and men are now transferred to it as convalescents from other stations. Tubercle and venereal cases do extremely well here, and this is probably due to the fact that they are treated on the top floor, the former on the verandah, and practically in the open air. The hospital is very well placed, the sea being on either side, so that we get the breeze in whatever direction it is blowing.

"Owing to the good water supply of Bombay, we rarely get any cases of enteric fever. My experience here—over three years—points to the fact that, almost without exception, any cases we have had have been distinctly proved to have been imported from other stations, and generally during the football tournament season, when teams come here to compete from all over India."

**NOTES FROM MALTA.**—Major C. E. Pollock, R.A.M.C., writes (May 31, 1908). "The postponed spring manœuvres were successfully held at the end of April. The infantry of the garrison embarked on the battleships of the fleet and effected a landing at the north of the island. The attacking force was well equipped with medical *personnel* and supplies, the defending force, consisting mainly of Royal Artillery, with some sappers and Malta Militia, having only a skeleton medical equipment. Two days hard fighting followed. The manœuvres were most instructive, especially as a practical demonstration of sanitation in the field.

"A long distance garrison race was held in May; unfortunately the day turned out to be the hottest of the present year. One Royal Army Medical Corps team entered, and finished without being placed. The spirits of the company were recently at a somewhat low ebb owing to the seasonal epidemic of examinations of various kinds; these having been finished with for a while, a cheerier frame of mind now prevails, and thoughts are directed towards cricket and our prospects for the coming season. Unfortunately we have lost several of our most useful members, and so far the new blood has not revealed anything very startling. We have only played one match, against the combined Army Service Corps and Army Ordnance Department team, which ended in a draw in favour of our opponents. This is not a very brilliant start, but we live in hope.

"With the departure of H.R.H. the Duke of Connaught, the season has definitely finished. The fortunate ones going on leave are arranging their plans, while those who are condemned to remain are busy devising plans to keep cool and avoid the evil companionship of sand-flies, mosquitoes, and other disturbers of the peace.

"*United Services Medical Society, Malta Branch.*—The second General Meeting of this Society was held on May 7, 1908, Colonel J. G. MacNeece, A.M.S. (President), and twenty-four naval and military members being present. The minutes of the first General Meeting having been read and confirmed, the President called on Major Lawson to read his paper. This was a description of a case of enteric fever in which one of the ulcers had perforated, allowing the intestinal contents to escape into the peritoneal cavity. As soon as the condition was recognised the patient was anæsthetised, Major Lawson opened the abdomen, found the perforation, and closed it with Lembert's sutures. The patient made an excellent recovery. The case is being sent to the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS for publication. A discussion followed. Fleet-Surgeon R. Hill, M.V.O , then showed a case of severe head injury in a Maltese shipwright, who fell from the rigging of a cruiser on to his head in December, 1906, sustaining a compound comminuted and depressed fracture of the skull, with extensive laceration of the brain and hæmorrhage from the middle meningeal artery. The broken pieces of bone were removed and the main trunk of the artery ligatured just before its bifurcation. Recovery was very satisfactory and complete. Seventeen months afterwards the man was perfectly well, never having had any fits, loss of memory or function, no hernia cerebri, and had worked all through the hot weather without any symptoms, the depression in his skull being protected by a silver plate worn in a skullcap. A discussion followed. Deputy-Inspector-General I. O'B. Williams, R.N., then proposed, and Fleet-Surgeon Corcoran seconded, the following motion, which was carried unanimously: 'That a meeting of the Society be called for the last week in October, and that an inaugural dinner be held the same evening.' Deputy-Inspector-General Williams then proposed a vote of thanks to the President, Colonel MacNeece, who replied in a short speech. The meeting then adjourned till after the hot weather."

**NOTES FROM NYASALAND.**—Captain H. Hardy, R.A.M.C., writes (April 5, 1908): "The rains have started here, which prevents one getting about. A case of tetanus in a Europeon which ended fatally has been in my charge. Sleeping sickness is reported to be raging along the British shores of Tanganyika, and the country between Tanganyika and the Luapula, on the Congo boundary, is also infected. Malaria fever is dying out here, owing to the systematic bi-weekly quinine administration. Of the *healthy* native children on the lake whose blood I examined during the last rains, no less than 75 per cent had parasites present, with two exceptions, all malignant tertian."

**NOTES FROM POONA, INDIA.**—Captain J. F. Martin, R.A.M.C., writes (May 29, 1908): "It is nearly a year since the last Poona letter appeared in the CORPS NEWS, so perhaps a short account of our doings during the last few months may be of interest. There have been several changes amongst officers of the Corps serving in the division during last year. Our Principal Medical Officer, Surgeon-General F. W. Trevor, has just gone home on eight months leave, and Colonel R. H. Forman, Principal Medical Officer, Bombay Brigade, has taken over his duties at headquarters. Lieutenant-Colonel S. C. B. Robinson from Ahmednagar has gone to Bombay, Lieutenant-Colonel J. Meak, Divisional Sanitary Officer, left us in March to officiate as Sanitary Officer at Army Headquarters, Captain R. B. Ainsworth being transferred from the 9th Division to act for him while in Simla. Lieutenant-Colonel G. F. H. Marks has been transferred to Poona from Calcutta. Captain L. Humphrey and Lieutenant W. C. Smales arrived from England during the last trooping season and have been posted to Poona, the former as Surgical Specialist. Major H. A. Hinge left us just before Christmas to take up the duties of Staff Officer for Medical Mobilisation Stores, 9th Division.

"The Annual Regatta took place last February. This year, for the first time on record, it lasted for three days, the entries being so numerous. The Indian Medical Service and ourselves, as has been the custom for the last few years, put in combined medical boats for the Service fours and Station eights. The 'Eights' this year were rowed over a ¾-mile course, four boats entering. In the first heat we drew our opponents of last year, the Royal Engineers, and after a most exciting race just managed to win by a canvas. In the finals we had no difficulty in beating, by 1½ lengths, an eight picked from the Indian Army Regiments stationed in Poona. This boat beat a club eight the previous day in the first round. *Crew:* Bow, Captain S. W. Jones, (2) Lieutenant-Colonel G. E. Fooks, (3) Captain E. L. Hodgson, (4) Captain D. Harvey, (5) Captain J. F. Martin, (6) Lieutenant W. Williams, (7) Captain F. H. Noke; Stroke, Captain J. Cunningham; Cox, Mrs. Martin. The prize, a very handsome silver cup, was presented by the eight to Mrs. Martin, the Cox. Only 3 fours entered for the 'Service Fours,' consequently the race was rowed off in one heat. The Royal Engineers beat our boat by half a length, and we in turn beat the Indian Army boat by 1½ lengths. The result of this race was a great disappointment, as from the practices of the four, we had great hopes of repeating our last year's success in this event too. *Crew:* Bow, Captain S. W. Jones, (2) Lieutenant W. Williams, (3) Captain F. H. Noke, Stroke, Captain J. Cunningham; Cox., Mrs. Martin. It must be mentioned here that Lieutenant L. A. Fanshaw, R.A., an old Oxford man, took a great amount of trouble in coaching our boats. His excellent coaching had a lot to do with the success of our eight. In the other events Captain F. H. Noke, R.A.M.C., partnered by Lieutenant J. S. Graham, 121st Pioneers, for the third year in succession, won the Oxenham Double Sculls, and Captain J. Cunningham, I.M.S., partnered by Miss Hume, just succeeded in winning the Mixed Double Sculls by a few inches after a most exciting race.

"Last year, at Bombay, in the Tennis Championships, Captain T. C. Lucas, partnered by Captain G. Lucas, of His Excellency the Governor's Body Guard, won the Championship Doubles, and was only beaten for the Single Championship in the finals. The same pair a few months afterwards won the Double Championship at Poona.

"Last September the members of the Corps stationed at Poona were 'At Home' on one of the days of the Poona Horse Show. We also presented a silver cup as a prize for one of the Horse Show events. During the year Captains F. H. Noke and T. C. Lucas have been home on six months leave, during which time they both passed the D.P.H. Cambridge.

"On account of the Mohmand Expedition this Division has been drawn upon pretty heavily for medical *personnel.* We have been practically denuded of Indian Medical Service Officers, but until now only four of our Corps have been despatched North, The fortunate ones being Captains L. Humphrey, R. C. Wilmot, C. R. Sylvester-Bradley and F. H. Noke, but it remains to be seen how many of them will actually succeed in getting up to the front."

**NOTES FROM POTCHEFSTROOM, TRANSVAAL.**—Lieutenant A. E. S. Irvine, R.A.M.C., writes "Since the last notes from this station were published, several changes have taken place in our staff. Colonel Maclean left early in February to take over his new appointment in India on promotion. Major Lenehan handed over the hospital to Lieutenant-Colonel Maher on March 2, and proceeded to Simonstown to take over medical charge of troops at that station. Captain McEntire proceeded home on six months leave early in March, and his wards and other duties were taken over by Lieutenant Sexton, who arrived here from the Curragh.

"Many rumours have been circulated here lately about the early closing of this station, but so far nothing has been circulated officially. Potchefstroom is a very popular station with the troops, all forms of sport being indulged in, and our detachment always had a prominent place at all games.

"The cricket season has just lately finished, and our team has done remarkably well, considering how few men we have to select a team from. The team was held in great respect by all opponents, and a hard fight and a stiff game for victory always resulted. Our best performances in the Cricket League were the defeats of the 4th (Queen's Own) Hussars Regimental XI. and the Town B XI.; both wins were thoroughly deserved. We played to win, and quite surprised our opponents in batting, bowling, and smart work in the field. The Serjeants mess gave a cricket 'At Home' at the end of January, when our team played the Serjeants 4th (Queen's Own) Hussars, and a good match resulted in a win for our opponents. The return game was played at the end of March, and, after a most exciting match, resulted in a win for our team by 8 wickets. The 4th Hussars went in first, knocking up 200 runs for 5 wickets and declaring; of this score, however, Serjeant Corbett made 142, not out. Our team went in and made 184 runs, Serjeant-Major Bollen contributing 75, and giving a fine batting display. In their second innings the 4th Hussars were completely beaten by the fine bowling of Serjeant-Major Bollen and Private Brown, and were all out for 45 runs. Serjeant-Major Bollen took 3 wickets for 28 runs, and Private Brown, a new arrival at this station, bowled in fine form also, capturing 5 wickets for 17 runs. Our team had now to make 2 runs to win, which were easily made for the loss of 3 wickets; Serjeant-Major Bollen 37, Staff-Serjeant Polhill 34, and Private Holmes 16. Lieutenant Colonel Maher, our new Commanding Officer, turned out in this match, and our only regret is that he did not arrive at this station earlier in the cricket season to strengthen our team. Taking the cricket season as a whole, we did remarkably well, under the Captaincy of Serjeant-Major Bollen, who was both our best batsman and bowler, his underhand bowling, which he tried at times, completely bewildering the batsmen. The following is a list of matches played, &c:—

### R.A.M.C. CRICKET CLUB, POTCHEFSTROOM, 1907-1908.

Played 30; won 13; lost 17.

*Batting Averages.*

| Name | Number of innings | Runs | Most in an innings | Number of times not out | Average |
|---|---|---|---|---|---|
| Serjeant-Major Bollen | 42 | 787 | 87* | 5 | 21·3 |
| Lance-Corporal Littleworth | 43 | 562 | 61* | 4 | 14·4 |
| Private Vivian | 16 | 170 | 36 | 3 | 13·0 |
| Staff-Serjeant Polhill | 36 | 377 | 49 | 2 | 11·1 |
| Lance-Corporal Jessop | 37 | 334 | 57 | 2 | 9·5 |
| Private Clarke | 40 | 324 | 39 | 2 | 8·5 |
| ,, Thorn | 37 | 288 | 39* | 2 | 8·2 |
| ,, Holmes | 22 | 117 | 23 | 1 | 5·6 |
| ,, Honey | 10 | 50 | 22 | 1 | 5·5 |
| ,, Smith | 16 | 68 | 14 | 3 | 5·2 |
| Corporal Pepper | 15 | 72 | 16 | -- | 4·8 |
| Private Hooper | 36 | 148 | 19 | 2 | 4·4 |
| ,, Clements | 12 | 40 | 11 | 2 | 4·0 |
| ,, Wills | 15 | 46 | 27 | 1 | 3·3 |
| Quartermaster-Serjeant Beaumont | 41 | 80 | 12 | 10 | 2·6 |

* Not out

*Bowling Averages.*

| Name | Wickets | Runs | Average |
|---|---|---|---|
| Lance-Corporal Jessop | 59 | 680 | 11·5 |
| Serjeant-Major Bollen | 146 | 1,722 | 11·8 |
| Staff-Serjeant Polhill | 82 | 11,71 | 14·3 |
| Private Hooper | 17 | 283 | 16·6 |
| ,, Thorn | 5 | 117 | 23·4 |

"Our football season has just commenced, and, when our teams learn each other's play a little better, promises well. In the League we beat B Squadron 9th Lancers by 6 goals to 1. Our football and cricket teams have both been greatly weakened by the loss of Lance-Corporal Littleworth, who has gone home tour-expired, but our new men are most enthusiastic, and with practice should be able to hold their own.

"We have also a Hockey XI., which is quite a good team.

"At the wind-up of the cricket season, the Serjeants' Mess gave a tennis 'At Home' and social evening, both of which were a great success, tennis, quoits, puff billiards, &c., being indulged in. A large number of Serjeants and their wives, from the different corps and regiments in the garrison, were present, and the evening finished up with an impromptu dance and concert.

"By kind permission of Lieutenant-Colonel J. Maher, an excellent concert was held on April 11 for the patients in hospital, and Private Cove deserves great praise for all the trouble he took in organising the concert, and also for getting up the comic sketch. The concert went off without a hitch, and was thoroughly appreciated by a large audience, including Lieutenant-Colonel and Mrs. Maher, Lieutenant and Mrs. Irvine, Lieutenant Sexton, Lieutenant and Mrs. Brook, also the Misses Brook, the Matron and Sisters, and a large number of friends from the garrison. Private Cove sang 'Come back to Borneo,' and Miss Bollen (junior) joined in the refrain, the effect being very pretty. Miss G. Brook also sang two songs, which were loudly applauded. Several friends from the garrison volunteered their services. 'The Irish Comedians' caused roars of laughter by their quaint antics and extremely comic turn. The violin solos by Private Hockey, 4th Hussars, were thoroughly appreciated and listened to with rapt attention The comic sketch was quite good and we have discovered quite a lot of talent amongst our detachment Unfortunately, at the last moment, Private Taylor, our leading comedian, left for Middelburg, Cape Colony, but we feel sure that his talents will be utilised at his new station. A most enjoyable evening ended by the singing of the National Anthem. The following is the programme:—

### "HOSPITAL THEATRE, POTCHEFSTROOM.

"By kind permission of Lieutenant-Colonel J. Maher, R.A.M.C., the following variety entertainment was held on Saturday evening, April 11, 1908, commencing at 8 p.m."

### *Programme.*

#### Part I.

| | | | |
|---|---|---|---|
| 1. | *Pianoforte Selection* | "The Coon's Cakewalk" | Pte Bevington, 9th Lancers. |
| 2. | *Song* | "Rank and File" | Sjt. Westcombe, 9th Lancers. |
| 3. | *Song* | "'Twas an Old, Old Story" | Pte. Cove, R.A.M.C. |
| 4. | *Double Turn* | "The Irish Comedians" | Corpl. Forbes and Pte. Hawkins, 9th Lancers. |
| 5. | *Song* | "Link Divine" | Miss G. Brook. |
| 6. | *Violin Solo* | Intermezzo from "Cavalleria Rusticana" | Pte. Hockey, 4th Hussars. |
| 7. | *Song* | "In Friendship's Name" | Miss G. Bollen. |
| 8. | *Song* | "A Soldier's Song" | Sjt.-Maj. Lindop, R.F.A. |
| 9. | *Cornet Solo* | "Sleep and Forget" | Corpl. White, 4th Hussars. |
| 10. | | Selected | Lieut. J. Kemple, 9th Lancers. |

#### Part II.

| | | | |
|---|---|---|---|
| 1. | *Pianoforte Selection* | "Over the Waves" | Miss B. Bollen. |
| 2. | *Serio Song* | "Come Back to Borneo" | Pte. Cove, R.A.M.C. |
| 3. | *Comic Song* | "Chemists Assist" | Pte. Bevington, 9th Lancers. |
| 4. | *Song* | "The Statues in Trafalgar Square" | Sjt. Westcombe, 9th Lancers. |
| 5. | *Song* | "Under the Dee—oh—Dah" | Miss G. Brook. |
| 6. | *Song* | Selected | Lieut. Kemple, 9th Lancers. |
| 7. | *Cornet Solo* | "Kathleen Mavourneen" | Corpl. White, 4th Hussars. |
| 8. | *Song* | "Teasing" | Miss G. Bollen. |
| 9. | *Violin Solo* | "Killarney" | Pte. Hockey, 4th Hussars. |
| 10. | *Song* | "Venetian Song" | Sjt.-Major Lindop, R.F.A. |

#### *Comic Sketch.*

"A Burglar's Night Out."

Private Cove, R.A.M.C.
,, Turner, R.A.M.C.
,, Wells, R.A.M.C.
Private Bevington, 9th Lancers.
,, Hawkins, 9th Lancers.

"God Save the King."

*Accompanists*—Misses B. Bollen and G. Brook, and Private Bevington, 9th Lancers.

**NOTES FROM PRETORIA.**—Lieutenant-Colonel M. O'Halloran, R.A.M.C., Staff Officer to the Principal Medical Officer, His Majesty's Forces in South Africa, writes (May 4, 1908).—

"*Postings.*—The undermentioned officers, Royal Army Medical Corps, on arrival off leave from England have been posted to Stations as under: Captain O. Ievers, Pretoria, Artillery Barracks; Captain F. C. Lambert, Bloemfontein; Captain E. M. Glanvill, Harrismith; Captain E. C. Whitehead, Pretoria; Captain L. Addams-Williams, Pretoria. The following changes amongst officers, Royal Army Medical Corps, have taken place in the South African Command: Captain P. J. Hanafin, to Wynberg, Cape Colony, from Pretoria, for duty.

"*Leave.*—The undermentioned officer embarked for England on sick leave. Quartermaster and Hon. Lieutenant W. G. Holway."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, R.A.M.C., Secretary to Principal Medical Officer, His Majesty's Forces in India, writes (May 21, 1908):—

"*Appointments.*—Surgeon-General W. L. Gubbins, C.B., M.V.O., has been directed to proceed to England to take up the appointment of Deputy Director-General, War Office, and embarks at Bombay on June 6. Lieutenant-Colonel R. S. F. Henderson is appointed Secretary to Principal Medical Officer, His Majesty's Forces in India, with effect from May 9, 1908, *vice* Lieutenant-Colonel H. B. Matthias, D.S.O.; vacated prior to taking up appointment of Principal Medical Officer Egyptian Army. Colonel O. E. P. Lloyd, V.C., has been appointed Honorary Surgeon to the Viceroy *vice* Colonel J. F. Williamson, C.B., C.M.G., V.H.S. The following officers have been appointed as Principal Medical Officers: Colonel H. R. Whitehead, as Principal Medical Officer, Mohmand Field Force. Lieutenant-Colonel M. W. O'Keefe, as temporary Principal Medical Officer, 1st (Peshawar) Division. Lieutenant-Colonel A. S. Rose, to officiate as Principal Medical Officer Allahabad and Fyzabad Brigade, pending arrival of successor to Colonel G. D. N. Leake.

"*Examination.*—The following officers have passed in the subjects noted:—

"(*d*) *i* Major N. Faichnie.

"Sanitation and Epidemiology, Major F. W. Begbie.

"(*d*) *ii* and Technical Subjects, Major W. G. Beyts.

"Technical Subjects, Majors L. P. More and W. J. Taylor.

"(*d*) *ii* and in (*h*) *ii* and *iii*, Lieutenant W. Benson.

"(*h*) *ii* and *iii*, Lieutenant C. E. W. S. Fawcett.

"(*d*) *ii* and in (*h*) *ii* and *iii*, Lieutenants T. Scatchard, T. B. Moriarty, M. B. H. Ritchie.

"(*h*) *ii* and *iii*, Lieutenant A. E. F. Hastings.

"(*d*) *ii* Lieutenant M. J. Cromie.

"(*d*) *ii* and in (*h*) *ii* and *iii*, Lieutenants W. C. Nimmo, M. Keane, R. S. Smyth, W. Egan, C. R. M. Morris, R. E. U. Newman.

"(*h*) *ii* and *iii*, Lieutenant A. H. Bond.

"(*d*) *ii* and in (*h*) *ii* and *iii*, Lieutenant D. de C. O'Grady.

"*Leave.*—Lieutenant-Colonel H. B. Matthias, D.S.O., has been granted three months general leave, ex-India, from May 5, 1908, prior to taking up appointment as Principal Medical Officer Egyptian Army. The following officers have been granted extension of medical certificate leave, ex-India: Major G. Raymond, from May 1, 1908, to July 20, 1908; Captain D. L. Harding, from April 10, 1908, to July 9, 1908.

"*Specialists.*—The following officers are appointed specialists in (*c*) Advanced Operative Surgery, with effect from May 1, 1908: Captain J. F. C. Mackenzie, 7th (Meerut) Division; Captain J. B. Meldon, 9th (Secunderabad) Division.

"*Transfers.*—The following officers have been temporarily transferred to 1st (Peshawar) Division on account of Mohmand Field Force: Lieutenant-Colonel M. W. O'Keefe, 2nd (Rawal Pindi) Division; Lieutenant-Colonel F. S. LeQuesne, 8th (Lucknow) Division; Major H. N. Dunn from 3rd (Lahore) Division; Major G. J. Buchanan, from 7th (Meerut) Division; Major N. Faichnie from 2nd (Rawal Pindi) Division; Major F. Smith from 2nd (Rawal Pindi) Division; Major R. J. Copeland from 7th (Meerut) Division. Captain W. E. Hudleston from 5th (Mhow) Division; Captain L. Humphrey from 6th (Poona) Division; Captain C. A. J. A. Balck from 2nd (Rawal Pindi) Division; Captain H. G. S. Webb from 3rd (Lahore) Division; Captain S. B. Smith from 3rd (Lahore) Division, Captain R. T. Collins from 7th (Meerut) Division; Captain G. H. Richard from 8th (Lucknow) Division; Captain G. W. Wade from 8th (Lucknow) Division; Captain J. G. Bell from 3rd (Lahore) Division. Lieutenant M. B. H. Ritchie from 2nd (Rawal Pindi) Division. The following officers have been temporarily transferred to 2nd (Rawal Pindi) Division on account of the Mohmnd Field Force: Captain S. L Pallant from 5th (Mhow) Division; Captain R. C. Wilmot rom 6th (Poona) Division."

**NOTES FROM WYNBERG, CAPE COLONY.**—Serjeant-Major C. W. Kinsella writes: "Our new Administrative Medical Officer, Colonel A. Peterkin, arrived from Mauritius on May 11, and assumed his duties. The new Administrative Medical Officer inspected the Wynberg Hospital on May 16. Lieutenant-Colonel S. Hickson, on relinquishing the Acting Administrative Medical Officer's duties, resumes command of the company. All ranks are very pleased to read of Surgeon-General Dorman's promotion, and his appointment to the Eastern Command. Nursing Sister E. Bond, A N.S.R., has been ill for the past month, suffering from enteric fever, and shortly will appear before a medical board. Lieutenant W. H. Forsyth went up for (*d*) *ii* and (*h*) *ii* and *iii* at the examination held on May 18. Mrs. Holway, wife of Lieutenant and Quartermaster W. G. Holway, sailed for England, invalided, on the s.s. 'Galeka' on May 11.

"Our hockey team, under the captaincy of Captain P. J. Hanafin, with Serjeant Hurst as Secretary, is shaping well, and in two matches played against the Serjeants of the 3rd Worcestershires, we have won one and drawn the second. We hope shortly to meet some good civil teams. Captain Hanafin has endeavoured to secure the support of the various units in the Cape Peninsula in raising a garrison team, but, so far, with little success.

"The members of the Cape Town Garrison Serjeants' Mess recently had a day crossing Table Mountain, and on arrival at Wynberg were hospitably entertained by our Serjeants' Mess, a pleasant evening being spent. Our Mess made a return journey during the following week, and were entertained by our former guests at the Castle. An eminent local cartoonist favoured us with a likeness of one of our worthy Staff-Serjeants as he appeared at the end of the descent of the well-known 420 steps in the

Slanghoolie Gorge, but 'Ciel!' it shall not go to the Journal for reproduction. On May 8, our Serjeants combined with those of the No. 9 Company Army Service Corps, in meeting the Castle Mess at euchre, whist, and bridge. In the two latter games our members' skill was too much for the Garrison's representatives. Much harmony enlivened the evening, the Royal Army Medical Corps securing several vocal triumphs. Lieutenant W. H. Forsyth went up."

### QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following ladies have received appointments as Staff Nurse: Miss I. D. Humfrey, A.N.S.R., Miss G. E. Browning, Miss N. I. Jordan, Miss M. A. W. Green, Miss M. C. Tawney.

*Postings and Transfers.*—Sisters: Miss E. Body, to Military Hospital, Canterbury, from Military Hospital, Dover. Staff Nurses: Miss M. E. Jacob, to the Queen Alexandra Military Hospital, Millbank, London, on appointment; Miss M. J. Branson, to the Queen Alexandra Military Hospital, Millbank, London, on appointment; Miss M. I. Taylor, to Military Hospital, Shorncliffe, on appointment; Miss C. M. Pearce, to Cambridge Hospital, Aldershot, on appointment; Miss M. C. Johnston, to Military Hospital, Dover, from Cambridge Hospital, Aldershot; Miss B. Rankin, to Military Hospital, Cork, from Military Hospital, Curragh, Miss E. A Harvey, to Military Hospital, Dover, from the Queen Alexandra Military Hospital, Millbank, London; Miss S. N. Daly, to Military Hospital, Curragh, from Military Hospital, Shorncliffe; Miss A. E. Allen, to Cambridge Hospital, Aldershot, from the Alexandra Military Hospital, Cosham; Miss A. R. Sibbald, to the Alexandra Military Hospital, Cosham, from Cambridge Hospital, Aldershot; Miss G. A. Howe, to Military Hospital, Hounslow, from Cambridge Hospital, Aldershot; Miss E. R. Collins, to Military Hospital, Tidworth, from Military Hospital, Hounslow; Miss E. Cooke, to Cambridge Hospital, Aldershot, on appointment.

*Promotion.*—The undermentioned Staff Nurse to be Sister: Miss D. M. C. Michell.

*Appointments Confirmed.*—Staff Nurses. Miss M. E. Don.

### ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Major Charles L. Fraser to be Surgeon-Lieutenant-Colonel, dated May 5, 1908.

Surgeon-Captain James Cameron to be Surgeon-Major, dated May 13, 1908.

Surgeon-Lieutenant James S. Warrack, M.D., to be Surgeon-Captain, dated May 19, 1908.

### IMPERIAL YEOMANRY.

*Dorset (Queen's Own).*—Surgeon-Lieutenant Charles W. Edwards resigns his commission, dated March 31, 1908.

### VOLUNTEER CORPS.

*9th Volunteer Battalion (Highlanders) The Royal Scots (Lothian Regiment)*—Surgeon-Captain Kenneth MacK. Douglas, M.D., resigns his commission, dated March 31, 1908.

*1st Volunteer Battalion The Royal Scots Fusiliers.*—Surgeon-Lieutenant-Colonel William Frew, M.D., is granted the honorary rank of Surgeon-Colonel, dated March 30, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel William Frew, M.D., resigns his commission, with permission to retain his rank, and to wear the prescribed uniform, dated March 31, 1908.

## EXAMINATIONS.

THE following results of examinations are notified for general information:—

Passed in Military Law for the rank of Lieutenant-Colonel: Majors N. Faichnie, M.B., and W. G. Beyts.

Passed in Technical Subjects for the rank of Lieutenant-Colonel: Majors W. G. Beyts, L. P. More, M.B., and W. J. Taylor, M.B.

Passed in Sanitation and Epidemiology: Major F. W. Begbie.

Passed in (*h*) *i* for rank of Captain: Lieutenants W. J. Weston, H. E. Priestley, C. M. Drew, M.B., E. C. Phelan, M.B., J. A. Bennett, M.B., J. J. O'Keefe, M.B., C. Kelly, M.B., M. G. Dill, M.B., H. L. Howell, P. J. Marett, and J. B. G. Mulligan.

Passed in (*h*) *ii* and *iii* for the rank of Captain: Lieutenants W. Benson, M.B., C. E. W. S. Fawcett, M.B., T. Scatchard, T. B. Moriarty, M. B. H. Ritchie, M.B. (80 per cent.),[1] A. E. F. Hastings, W. C. Nimmo, M. Keane, R. S. Smyth, M.D. (80 per cent.), W. Egan, M.B., C. R. M. Morris, M.B., R. E. V. Newman, M.B., A. H. Bond, and D. de C. O'Grady.

Passed in (*d*) *ii* for the rank of Captain: Lieutenants W. Benson, M.B., M. B. H. Ritchie, M.B. (75 per cent.),[1] T. Scatchard, T. B. Moriarty, M. J. Cromie, W. C. Nimmo, M. Keane, R. S. Smyth, M.D., W. Egan, M.B., C. R. M. Morris, M.B., R. E. V. Newman, M.B., and D. de C. O'Grady.

## THE PARKES MEMORIAL PRIZE,

Consisting of seventy-five guineas and a bronze medal, is awarded every third year to the writer of the best essay on a subject connected with Hygiene.

The Competition is open to the Medical Officers of the Royal Navy, Army and Indian Services, of Executive Rank on full pay, with the exception of the Professors and Assistant Professors of the Royal Naval Hospital, Haslar, and the Royal Army Medical College, London, during their term of office.

The subject for the next prize is the following: "The Part Played by Blood-sucking Insects in the Causation and Spread of Disease in Man, and the Measures to be Recommended for the Prevention of such Diseases." (Note.—The Essay must include the results of personal observation and research.)

Essays to be sent in to the Secretary of the Prizes Committee, Royal Army Medical College, Millbank, London, on or before December 31, 1909. Each essay to have a motto, and to be accompanied with a sealed envelope bearing the same motto, and containing the name of the competitor. The successful essay becomes the property of the Prizes Committee.

By order of the Prizes Committee: Surgeon-General Sir A. Keogh, K.C.B., Director-General, A.M.S., *President*; Captain C. F. Wanhill, R.A.M.C., *Secretary*.

## THE ALEXANDER MEMORIAL PRIZE,

Consisting of £50 and a gold medal, is awarded every third year to the writer of the best essay on a subject connected with Military Medicine, Surgery, or Hygiene.

The Competition is open to Executive Officers of the Royal Army Medical Corps on full pay, with the exception of Professors and Assistant Professors of the Royal Army Medical College during their term of office.

The subject for the next prize is the following: "Functional and Organic Diseases of the Heart in the Army; their Prevalence and Influence on Efficiency; their Causes; Suggestions for Preventive Measures and their Treatment." The essay should embody the results of personal observation and research. No essay should exceed about 20,000 words, exclusive of tables, which may be added in the form of appendices. Essays to be sent in to the Secretary of the Prizes Committee, Royal Army Medical College, on or before December 31, 1908. Each essay to have a motto, and to be accompanied with a sealed envelope bearing the same motto, and containing the name of the competitor.

By order of the Prizes Committee: Surgeon-General Sir A. Keogh, K.C.B., Director-General, A.M.S., *President*; Major C. E. P. Fowler, R.A.M.C., *Secretary*.

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[1] M. B. H. Ritchie, M.B., Special Certificate.

# REGISTER FOR INDIAN SERVANTS.

Few officers on going to India have not experienced the difficulty of getting good servants. The discomforts on arrival and of a long journey up country, unprovided with a bearer, or, what is worse, provided with a hastily selected man, taken haphazard from the crowd of indifferent or bad characters who congregate in Bombay, have fallen to the lot of most of us, whilst the period of trial and vexation until a proper staff of servants is secured is familiar to us all.

In our Corps, with regular annual reliefs, it should not be difficult to arrange for an interchange. Officers leaving India would then be able to provide places for the good and tried retainers they are relinquishing, and new arrivals would, by taking on these men, be spared many of the worries and troubles which now befall them. Further, good servants would not be lost to the Corps, and the prospects of continuous employment could not fail to have attraction for the better class of men.

With these ends in view, officers due home from India are requested to communicate to the Journal particulars of servants whom they can recommend, so that officers going out in relief may have an opportunity of securing these men. The particulars required are :—

(1) Class of servant.
(2) Whether for bachelor or married officer.
(3) District or station to which he belongs
(4) Any special recommendations.

Note.—The date the officer leaves India should also be stated, and when and where the servant will be available.

# BOMBAY MEDICAL CONGRESS.

It is proposed to hold a Medical Congress in Bombay towards the end of February, 1909, having special reference to Tropical Diseases and Sanitation as applied to India. The following are some of the details relating to the undertaking: The Central Committee consists of representatives of different branches of the medical profession (official and unofficial), including medical societies and the medical press. It will be held under the Presidentship of His Excellency the Governor of Bombay; the Members of his Council, the Director-General of the Indian Medical Service, the Principal Medical Officer H.M.'s Forces in India, the Surgeon-General with the Government of Bombay, the Principal Medical officer H.M.'s Forces, Poona Division, the Senior Medical Officer of the Royal Navy in Bombay and Representative Native Medical Practitioners being among the Vice-Presidents, and the General Secretary (and Editor of *Transactions*) being Lieutenant-Colonel W. E. Jennings, I.M.S. The subjects to be considered are: The Etiology, Prophylaxis and Treatment of Plague; the Etiology and Prophylaxis of Enteric Fever; the Etiology and Prophylaxis of Relapsing Fever; the Etiology, Pathology and Treatment of Tropical Diarrhœas; the Differential Diagnosis of the various types of Malarial Fever, with suggestions as to means of prevention and exhibition of the results of past measures from available statistics; the Etiology, Differential Diagnosis and Sequelæ of the various Clinical Types of Dysentery, their treatment and prophylaxis; the Pathological Conditions dependent upon the invasion of the Leishman-Donovan Body, with suggestions as to treatment and prophylaxis; the part played by Parasitic Insects (other than fleas and mosquitoes) in the dissemination of diseases peculiar to the Tropics, the Geographical Distribution of these insects, and suggestions as to the best means of obviating their attacks; the Clinical and Pathological Effects of the different varieties of Snake Venom, and results of special lines of treatment illustrated from available statistics; the Etiology, Pathology, Prophylaxis and Treatment of Beri-beri; the Pathology, Distribution and Bacteriology of Elephantiasis and Mycetoma; the Prophylaxis, Bacteriology and results of special methods of treatment of Leprosy; the Treatment of Cholera; Tropical Surgery; and Sanitation as applied to India. There will be an exhibition of Pathological and Microscopical Specimens, of Medical, Surgical and Sanitary Appliances, and, during one night of the Session, a series of Lantern Slide demonstrations as well. Admission will be free to all members of the medical profession, subject to such restrictions as shall be prescribed by the Central Committee, but Medical Subscribers of 10 rupees or over will be entitled to admission unconditionally, while those of 15 rupees or over will have their names registered as well for a free copy of the *Transactions* (which would, otherwise, have to be purchased). Lay subscribers of 15 rupees and upwards will be registered for a free copy of the *Transactions*, while those of 20 rupees and upwards will be entitled to admission cards as well if desirous of attending. The Committee will specially invite original contributions from prominent authorities on the above subjects, but are also prepared to consider the inclusion of voluntary contributions from those desirous of contributing. All medical visitors to the Congress will be at liberty to join in the debates so far as the limit of time for each subject will permit. The Session will extend over four days, and the subjects will be considered in six sections.

## THE RETIREMENT OF MR. GILLHAM.

THE following additional subscriptions have been received:—

| | £ | s. | d. |
|---|---|---|---|
| Balance (May 16, 1908) | 9 | 4 | 0 |
| Lieutenant H. G. Sherren | 0 | 5 | 0 |
| Captain F. S. Irvine | 1 | 0 | 0 |
| Major F. Tibbits | 0 | 10 | 0 |
| Received to date June 15, 1908 | £10 | 19 | 0 |

Subscriptions to the "Gillham Fund," the objects of which are explained in the CORPS NEWS for March, 1908, p. 83, may be sent to Captain C. F. Wanhill, R.A.M.C., Royal Army Medical College, Millbank, London, S.W., and will be acknowledged in this publication.

## BRITISH MEDICAL ASSOCIATION.

SEVENTY-SIXTH ANNUAL MEETING, SHEFFIELD, JULY 28, 29, 30, and 31, 1908.

*Navy, Army, and Ambulance Section.*

*President:* Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O., S. Farnborough.

*Vice-Presidents:* Surgeon-Lieutenant Colonel E. M. Wrench, M.V.O., M.D., Derbyshire; Lieutenant Colonel R. H. Penton, D.S.O., R.A.M.C., York; Colonel Charles J. Trimble, C.M.G., Preston; Fleet-Surgeon E. J. Biden, R.N., Fareham.

*Hon. Secretaries* Surgeon-Captain Sidney F. Barber, H.V.B., 11, St. Barnabas Road, Highfield, Sheffield; Surgeon-Captain A. C. Turner, W.R.R.E.V., 287, Glossop Road, Sheffield.

The following discussions and papers have been arranged for this Section.

*Wednesday, July 29, 1908, at 10 a.m.*

Introductory Remarks by President.

"Alcohol"—Lieutenant-Colonel A. M. Davies (Professor of Hygiene at R.A.M. College).

"Alcohol in the Army"—Major G. S. Crawford, R.A.M.C.

"Feeding of the Soldier in Barracks, Hospital, and War"—Major R. J. Blackham, R.A.M.C.

General discussion.

Replies by officers reading papers.

"Importance of Teaching Trades in the Army"—Captain W. Sinclair, R.A.M.C. (Militia).

*Thursday, July 30, 1908, at 10 a.m.*

"The Position of St. John Ambulance Brigade as regards Mobilisation"—Inspector-General Belgrave Ninnis (Chief Commissioner, St. John Ambulance Brigade).

"Employment of St. John Ambulance Brigade as a Home Hospital Reserve"—Lieutenant-Colonel G. E. Twiss, R.A.M.C. (Chief Superintendent, No. II. District St. John Ambulance Brigade).

General discussion and replies.

"The Transport of Sick and Wounded by Train"—Lieutenant-Colonel W. G. Macpherson, C.M.G., R.A.M.C.

"An Account of the Subordinate Indian Medical Service"—Colonel C. H. Joubert de la Forté, I.M.S.

*Friday, July* 31, 1908, *at* 10 *a.m.*

"Atoxyl in Syphilis"—Colonel F. J. Lambkin, R.A.M.C.

"Oral Sepsis"—Major P. J. Probyn, D.S.O., R.A.M.C.

"Prevention of Malaria in Singapore"—Lieutenant-Colonel H. H. Johnston, C.B., R.A.M.C.

"Lessons from the Past."—Surgeon-Lieutenant-Colonel E. M. Wrench, M.V.O.

Concluding remarks by President.

# THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

An Extraordinary General Meeting of the Incorporated Society of Medical Officers of Health took place at the offices of the Society, 1, Upper Montague Street, Russell Square, London, W.C., on June 19, 1908. The meeting was presided over by Dr. George Reid, Medical Officer of Health to the Staffordshire County Council, and President of the Society, who was heartily congratulated by the Meeting on his return to his official duties after a long and serious illness. Resolutions were passed unanimously by which the membership of the Society will be limited in future to two classes, viz.: Fellows and Associates. It was also agreed that the Fellowship of the Society shall be open to the following. Medical Officers of Health, acting or retired, whether in the British Isles and Dependencies, or elsewhere. Medical Officers (Sanitary) of the Navy and Army (at home or abroad). All registered Medical Practitioners holding a Diploma in Sanitary Science, Public Health or State Medicine, under Section 21 of the Medical Act, 1886. All Medical Inspectors of the Local Government Boards or other Government Department of England and Wales, Scotland and Ireland. Medical Officers appointed by Education Authorities. The confirmatory meeting will be held in the Law Courts at Cardiff on July 17, 1908.

# REPORT OF THE ARMY MEDICAL OFFICERS' WIDOWS' AND ORPHANS' FUND,

*Laid before the Ninety-third Annual General Meeting at the Royal Army Medical College, Millbank, Grosvenor Road, S.W., on Tuesday, May 26, 1908.*

Surgeon-General Sir A. Keogh, M.D., K.C.B., President, in the chair.

The advertisement in the *Times*, convening the Meeting, having been read by the Secretary, the accounts for the year ended December 31, 1907, together with the Committee and Auditors' Reports, were submitted, and were adopted and ordered to be printed and circulated amongst the members of the Society.

The Committee of Management and Auditors for the year 1908-1909 were appointed.

Messrs. Deloitte, Plender, Griffiths and Co. were appointed Auditors under Rule 30.

A vote of thanks was passed to the President, Vice-Presidents, Trustees, Committee of Management, and Auditors, and the Chairman of the day.

This Society was instituted in January, 1816.

*President.*—Surgeon-General Sir A. Keogh, M.D., K.C.B., Director-General.

*Vice-Presidents.*—C. A. Innes, M.D., Deputy Surgeon-General; W. G. Don, M.D., Deputy Surgeon-General.

# ARMY MEDICAL OFFICERS' WIDOWS' AND ORPHANS' FUND.

CASH ACCOUNTS FOR THE YEAR ENDING DECEMBER 31, 1907.

## (I.) OLD ACCOUNT.

| Dr. | £ | s. | d. |
|---|---|---|---|
| Balance of Cash brought forward from previous year's Account .. .. .. .. .. .. .. | 819 | 11 | 10 |
| Subscriptions received .. .. .. .. .. .. | 6 | 0 | 0 |
| Marriage Fines received .. .. .. .. .. .. | 70 | 0 | 0 |
| Interest on Investments with the National Debt Commissioners .. .. .. .. .. .. .. | 3,278 | 10 | 2 |
| Withdrawn from Investments with the National Debt Commissioners .. .. .. .. .. .. .. | 1,000 | 0 | 0 |
| | £5,174 | 2 | 0 |

| Cr. | £ | s. | d. |
|---|---|---|---|
| Annuities paid to Widows (after deducting Income Tax) | 1,369 | 16 | 5 |
| Income Tax deducted from Annuities and paid to the Commissioners of Inland Revenue .. .. .. | 76 | 0 | 7 |
| Invested with the National Debt Commissioners .. | 3,262 | 5 | 3 |
| Donation paid to Widow .. .. .. .. .. .. | 25 | 0 | 0 |
| Actuary's Fees paid .. .. .. .. .. .. | 44 | 1 | 0 |
| Secretary's Salary paid from October 1, 1906, to September 30, 1907 .. .. .. .. .. .. | 150 | 0 | 0 |
| Secretary's Office Allowance paid from October 1, 1906, to September 30, 1907 .. .. .. .. .. | 60 | 0 | 0 |
| Printing, Postages, Stationery, &c., paid from October 1, 1906, to September 30, 1907 .. .. | 50 | 5 | 10 |
| Balance of Cash carried forward to next year's Account | 136 | 12 | 11 |
| | £5,174 | 2 | 0 |

## (II.) NEW ACCOUNT.

| Dr. | £ | s. | d. |
|---|---|---|---|
| Balance of Cash brought forward from previous year's Account .. .. .. .. .. .. .. | 1,173 | 4 | 2 |
| Subscriptions received .. .. .. .. .. .. | 1,364 | 8 | 3 |
| Marriage Fines received .. .. .. .. .. .. | 20 | 10 | 0 |
| Interest on Investments with the National Debt Commissioners .. .. .. .. .. .. .. | 690 | 19 | 1 |
| Dividends received on Railway Debenture Stock (less Tax deducted, £20 3s. 6d.) .. .. .. .. .. | 383 | 9 | 4 |
| Dividends received on Two and a Half per Cent Consols (less Tax deducted, £6 3s.) .. .. .. .. .. | 116 | 16 | 0 |
| Withdrawn from Investment with the National Debt Commissioners .. .. .. .. .. .. .. | 1,600 | 0 | 0 |
| | £5,349 | 6 | 10 |

| Cr. | £ | s. | d. |
|---|---|---|---|
| Annuities paid to Widows (after deducting Income Tax) | 2,036 | 5 | 8 |
| Income Tax deducted from Annuities and paid to the Commissioners of Inland Revenue .. .. .. | 105 | 11 | 1 |
| Invested with the National Debt Commissioners .. | 670 | 3 | 1 |
| Donation paid to Widow .. .. .. .. .. .. | 25 | 0 | 0 |
| Balance of Cash carried forward to next year's Account | 2,512 | 7 | 0 |
| | £5,349 | 6 | 10 |

## ACCOUNTS FOR THE YEAR 1907.

(*In the Form Prescribed for the Annual Return of a Registered Friendly Society.*)

### (A) BENEFIT FUND.

DR.

| INCOME. | | £ | s. | d. |
|---|---|---|---|---|
| Contributions for Benefits— | | | | |
| Subscriptions for Widows' and Orphans' Fund .. .. .. | £948 12 3 | | | |
| Marriage Fines .. .. .. | 125 10 0 | | | |
| | | 1,074 | 2 | 3 |
| Interest on Investment of Benefit Funds (less £26 6s. 6d. deducted from payments) .. .. | | 4,469 | 14 | 7 |
| Total Income .. | | 5,543 | 16 | 10 |
| Amount of Benefit Fund at the beginning of the year as per last return .. .. .. .. | | 122,756 | 11 | 7 |
| | | £128,300 | 8 | 5 |

CR.

| EXPENDITURE. | £ | s. | d. |
|---|---|---|---|
| Widows' Annuities (after deducting Income Tax) .. | 3,302 | 10 | 10 |
| Income Tax on Annuities .. .. .. .. .. | 179 | 5 | 5 |
| Donations to Widows .. .. .. .. .. .. | 50 | 0 | 0 |
| Interest on £4,531 4s. 10d. (balance of Management Fund at the end of the year 1906) at 3 per cent... | 135 | 18 | 9 |
| Total Expenditure . | 3,667 | 15 | 0 |
| Amount of Benefit Fund at the end of the year as per Balance Sheet (C) .. .. .. .. | 124,632 | 13 | 5 |
| | £128,300 | 8 | 5 |

N.B.—The items of Income and Expenditure in the above Account are the amounts *due and payable* in the year 1907.

### (B) MANAGEMENT FUND.

DR.

| INCOME. | £ | s. | d. |
|---|---|---|---|
| Interest for one year on £4,531 4s. 10d. at 3 per cent. | 135 | 18 | 9 |
| Total Income .. | 135 | 18 | 9 |
| Management Fund at the beginning of the year (as per last Report) .. .. .. .. .. | 4,531 | 4 | 10 |
| | £4,667 | 3 | 7 |

CR.

| EXPENDITURE. | £ | s. | d. |
|---|---|---|---|
| Salaries and Office Allowance .. .. .. .. | 210 | 0 | 0 |
| Printing, Stationery, Postages, &c. .. .. .. | 9 | 9 | 0 |
| Actuary's Fees .. .. .. .. .. .. .. | 15 | 15 | 0 |
| Total Expenditure .. | 235 | 4 | 0 |
| Amount of Management Fund at the end of the year as per Balance Sheet (C) .. .. .. | 4,431 | 19 | 7 |
| | £4,667 | 3 | 7 |

N.B.—The items of Income and Expenditure in the above Account are the amounts *due and payable* in the year 1907.

## (C) BALANCE SHEET OF FUNDS AND EFFECTS, AS AT DECEMBER 31, 1907.

DR.

| | £ | s. | d. |
|---|---|---|---|
| Total Benefit Funds, as per Account (A) .. .. | 124,632 | 13 | 5 |
| Amount of Management Fund, as per Account (B) | 4,431 | 19 | 7 |
| Other Liabilities— | | | |
| Income Tax deducted from Annuities .. .. | 179 | 5 | 5 |
| Secretary's Salary and Office Allowance (from October 1 to December 31, 1907) .. .. | 52 | 10 | 0 |
| | £129,296 | 8 | 5 |

CR.

| Investments. | | Rate per cent. of Interest yielded. | £ | s. | d. |
|---|---|---|---|---|---|
| (1) In the Public Funds— | | | | | |
| Two and a Half per Cent. Consols, £4,917 18s. 10d. .. .. | | £2 15 0 | 4,468 | 9 | 10 |
| (2) With the Commissioners for the Reduction of the National Debt— | | | | | |
| Old Account, at 2¼d. per cent. per diem .. .. .. .. | | 3 16 0½ | 88,006 | 8 | 5 |
| New Account, at 2d. per cent. per diem .. .. .. .. | | 3 0 10 | 22,137 | 5 | 6 |
| (3) Other Securities— | | | | | |
| London and North-Western Railway Three per Cent. Debenture Stock | £5.000 0 0 | 3 19 8 | 3.763 | 9 | 6 |
| Caledonian Railway Four per cent. Debenture Stock .. .. | 1,449 0 0 | 3 14 9 | 1,550 | 14 | 4 |
| Midland Railway Two and a Half per Cent. Debenture Stock .. | 7.827 5 7 | 2 18 7 | 6,685 | 10 | 11 |
| Cash at Bankers .. .. .. .. .. .. | | | 2.648 | 19 | 11 |
| Outstanding Subscriptions at December 31, 1907 .. | | | 35 | 10 | 0 |
| | | | £129.296 | 8 | 5 |

We have examined the above Balance Sheet and Accounts with the Books and Vouchers of the Society and certify that they are in accordance therewith. The Securities, including Cash Balances, have been verified by us.

*London, Apri 29, 1908.*

DELOITTE, PLENDER, GRIFFITHS & CO.
*Chartered Accountants.*

J. WHIPPLE,
CHAS. McD. CUFFE, } *Auditors.*

*Trustees.*—J. Martin, Lieutenant-Colonel; J. Stevenson, M.D., Lieutenant-Colonel; C. A. Innes, M.D., Deputy Surgeon-General.

*Committee for* 1908-1909.—Surgeon-General Sir W. D. Wilson, K.C.M.G.; Lieutenant-Colonel W. Grant Macpherson, M.D., C.M.G.; Lieutenant-Colonel A. M. Davies; Lieutenant-Colonel M. W. Russell; Surgeon-General W. S. M. Price; Colonel J. Lane Notter, M.D.; Major E. L. McSheehy, M.D.; Lieutenant-Colonel A. F. S. Clarke, M.D.; Captain J. T. Clapham.

*Auditors.*—Messrs. Deloitte, Plender, Griffiths and Co., Chartered Accountants.

*Consulting Actuary.*—H. W. Andras, Esq., F.I.A.

*Secretary.*—Colonel Thomas Ligertwood, M.D., C.B., 16, Tedworth Gardens, Chelsea, S.W.

## REPORT AND ACCOUNTS FOR THE YEAR 1907.

*Report of the Committee to the Members of the Army Medical Officers' Widows' and Orphans' Fund.*

GENTLEMEN,—Your Committee have the pleasure to report on the affairs of the Society, and to submit the Accounts for the year 1907.

During the year the only changes in the investments of the Fund have been as follows:—

*Old Account.*—The sum of £3,262 5s. has been invested with the National Debt Commissioners, and the sum of £1,000 withdrawn from them for payment of Annuities.

*New Account.*—The sum of £670 3s. 1d. has been invested with the National Debt Commissioners, and the sum of £1,500 withdrawn from them for payment of Annuities.

The total value of the Stock Exchange Securities in the accompanying Balance Sheet is £16,168 4s. 7d., and the same Securities had an aggregate market value on December 31, 1907, of £16,204 9s. 7d.

Your Committee will be obliged if the Members will bring the advantages and strong financial position of the Society to the notice of their brother officers who have not yet joined the Fund, inasmuch as the benefits provided are obtained at a very much lower cost than from an ordinary Life Assurance Company. A Book of Rules containing Tables of Rates of Subscription and Particulars of Benefits can be obtained upon application to the Secretary.

*War Office, S.W.,*
*May* 26, 1908.

ALFRED KEOGH,
*Chairman of the Meeting of this date.*

The Committee especially draw the attention of Members who are in arrear with their Subscriptions to Rule XIII. of the Society. Subscriptions will be received by Colonel Ligertwood, M.D., C.B., 16, Tedworth Gardens, Chelsea, S.W., or by the Bankers of the Fund, Sir C. R. McGrigor, Bart., and Co., 25, Charles Street, St. James's Square, S.W.

## LIST OF THE MEMBERS OF THE SOCIETY ON DECEMBER 31, 1907.

*Married Members.*—Major G. F. Alexander, M.B.; Lieutenant-Colonel W. Alexander, M.D.; Lieutenant-Colonel J. Ambrose, M.D.; Major E. C. Anderson, D.S.O.; Colonel A. H. Anthonisz, M.B.; Captain W. F. Bailey, M.D.; Colonel H. J. Waller Barrow; Captain M. C. Beatty; Major F. W. Begbie; Surgeon-General George Deane Bourke; Major F. R. Buswell; Captain A. H. Clarke; Lieutenant-Colonel Alfred F. S. Clarke, M.D.; Deputy-Surgeon-General R. W. Clifton; Lieutenant-Colonel Francis Collins, M.D., Lieutenant-Colonel G. Coutts; Lieutenant-Colonel J. D. Crowe; Surgeon-General Sir Charles McD. Cuffe, K.C.B.; Lieutenant-Colonel A. M. Davies; Deputy Surgeon-General W. G. Don, M.D.; Major H. N. Dunn; Captain E. F. Ellery; Lieutenant-Colonel A. F. Elliot, M.D.; Major Charles Roulston Elliott, M.D.; Surgeon-General G. J. H. Evatt, M.D., C.B.; Lieutenant-Colonel R. J. L. Fayle, D.S.O.; Lieutenant-Colonel R. W. Ford, D.S.O.; Lieutenant-Colonel Denham F. Franklin; Captain R. S. H. Fuhr; Major T. W. Gibbard, M.B.; Surgeon-Major-General Charles Herve Giraud; Surgeon-General W. L. Gubbins, M.B., M.V.O.; Lieutenant-Colonel R. I. D. Hackett, M.D.; Major Thomas E. Hale, V.C., M.D., C.B.; Colonel F. W. L. Hodder, M.B.; Major Maurice Percy Cue Holt, D.S.O.; Surgeon-General Sir A. D. Home,

**V.C.**, K.C.B.; Captain C. H. Hopkins; Major W. H. Horrocks, M.B.; Major P. J. Ievers; Deputy-Surgeon-General C. A. Innes, M.D.; Lieutenant-Colonel W. M. James; Colonel J. M. Jones; Major A. E. C. Keble; Surgeon-General Sir A. Keogh, M.D., K.C.B.; Lieutenant-Colonel R. C. K. Laffan; Lieutenant-Colonel F. J. Lambkin; Lieutenant-Colonel John Langdon; Major W. B. Leishman; Lieutenant-Colonel T. S. Lloyd-Barrow, M.D.; Lieutenant-Colonel R. L. Love; Lieutenant-Colonel J. Maconachie; Lieutenant-Colonel R. N. MacPherson; Lieutenant-Colonel W. Grant Macpherson, M.B., C.M.G.; Lieutenant-Colonel N. Manders; Major F. M. Mangin; Major G. S. Mansfield; Captain J. F. Martin; Colonel William Thomas Martin, M.D.; Lieutenant-Colonel F. E. McFarland; Major J. G. McNaught, M.D.; Lieutenant-Colonel Peter John McQuaid; Major E. L. McSheehy, M.D.; Lieutenant Colonel H. J. R. Moberley; Major L. P. More, M.B.; Lieutenant-Colonel Thomas Moriarty, M.D.; Major W. T. Mould; Major E. H. Myles, M.B.; Lieutenant-Colonel F. P. Nichols, M.B., B.A.; Colonel J. Lane Notter, M.D.; Colonel Matthew D. O'Connell; Captain L. E. L. Parker; Surgeon-Major-General H. F. Paterson, M.D.; Major H. S. Peeke; Major C. E. Pollock; Major F. J. W. Porter, D.S.O.; Captain J. E. Powell; Lieutenant-Colonel G. F. Poynder; Surgeon-General W. S. M. Price; Major H. V. Prynne; Lieutenant-Colonel Eugenius A. Roche; Major C. C. Reilly; Lieutenant-Colonel Sir John Godfrey Rogers, M.B., K.C.M.G., D.S.O.; Lieutenant-Colonel A. F. Russell, M.B., C.M.G.; Lieutenant-Colonel M. W. Russell; Colonel John Stevenson, M.B.; Captain R. Storrs; Lieutenant-Colonel C. J. W. Tatham: Lieutenant-Colonel Wilford Burrell Thomson; Surgeon-General F. W. Trevor, M.B., C.B.; Major N. Tyacke; Major F. J. Wade Brown; Major Espine C. R. Ward; Lieutenant-Colonel L. B. Ward; Colonel Douglas Wardrop, M.B.; Colonel Francis Henry Welch; Captain A. E. Weld; Lieutenant-Colonel J. H. C. Whipple, M.D.; Lieutenant-Colonel M. L. White; Lieutenant-Colonel William O'B. White; Lieutenant-Colonel R. L. Whitehead; Surgeon-General Sir W. D. Wilson, M.B., K.C.M.G.; Captain B. F. Wingate; Major S. H. Withers, M.D.; Captain A. A. B. Wroughton.

*Unmarried Members.*—Colonel James Maybury Beamish. M.D.; Captain W. W. Browne; Major H. J. M. Buist; Captain J. T. Clapham; Major G. Dansey-Browning; Captain K. A. C. Doig; Lieutenant-Colonel Campbell Miller Douglas, **V.C.**, M D., Surgeon-General T. W. Fox, M.B.; Lieutenant-Colonel W. M. Harman, M.B.; Lieutenant-Colonel C. W. Johnson; Captain T. C. Lauder; Colonel Thomas Ligertwood, M.D., C.B.; Major B. W. Longhurst; Lieutenant-Colonel John Martin; Lieutenant-Colonel William B. Miller, M.D.; Lieutenant-Colonel J. M. Reid, M.D.

*Deaths and Withdrawals of Members during the Year* 1907.—Lieutenant-Colonel U. J. Bourke, 1st class married member, resigned; Deputy-Surgeon-General C. G. Irwin, M.B., 1st class married member, on death of wife; Deputy-Surgeon-General C. V. Cay, M.D., 1st class married member, died December 28, 1907; Deputy-Surgeon-General C. H. Harvey, M.D., 1st class bachelor member, resigned; Surgeon F. H. Spencer, M.D., 1st class married member, struck off; Captain P. J. R. Nunnerly, 1st class bachelor member, struck off.

*New Members.*—Captain B. F. Wingage, 1st class married member; Captain R. S. H. Fuhr, 1st class married member; Lieutenant-Colonel N. Manders, 1st class married member; Captain C. H. Hopkins, 1st class married member; Captain A. A. B. Wroughton, 1st class married member; Major P. J. Ievers, 1st class married member; Major J. M. Buist, 1st class bachelor member; Captain T. C. Lauder, 1st class bachelor member; Captain W. W. Browne, 1st class bachelor member; Captain A. H. Clarke, 1st class married member; Captain E. F. Ellery, 1st class married member; Lieutenant-Colonel R. L. Love, 1st class married member; Lieutenant K. A. C. Doig, 1st class bachelor member; Captain J. E. Powell, 1st class married member.

*Transferred from Married to Unmarried Members.*—Surgeon-General T. W. Fox, M.B., on death of wife.

*Death of Annuitant.*—Lady Hall, 1st class annuitant.

*New Annuitant.*—Mrs. Cay, 1st class annuitant.

THE FOLLOWING CHANGES HAVE TAKEN PLACE SINCE JANUARY 1, 1908.

*Deaths, Withdrawals, &c., of Members.*—Surgeon-General T.W. Fox, M.B., 1st Class Married Member, died March 28, 1908.

*New Members.*—Captain Howard Ensor, 1st class bachelor member; Captain W. J.

Waters, 1st class married member; Colonel Wm. Parker, 1st class married member; Lieutenant W. C. Smales, 1st class married member.

*Transferred from Unmarried to Married Members.*—Major B. W. Longhurst, from date of his marriage; Major G. Dansey-Browning, from date of his marriage.

*Transferred from Married to Unmarried Members.* —Lieutenant-Colonel W. G. Macpherson, M.B., C.M.G., on death of wife.

# THE ROYAL ARMY MEDICAL CORPS FUND.

## SIXTH GENERAL MEETING.

THIS meeting was held at the Royal Army Medical College, on Monday, June 15, 1908, at 3.30 p.m., Surgeon-General Sir Alfred Keogh, Director-General, in the chair.

The Chairman, in opening the meeting, stated: We hold to-day the Sixth Annual Meeting of the Royal Army Medical Corps Fund. For the benefit of those officers who have not been here before, I should like to explain that under the heading of the Royal Army Medical Corps Fund we have practically five funds. We have the Royal Army Medical Corps Fund proper, which consists of the Dinner, the Memorial and the Band. Then we have the General Relief, and the fund called the Compassionate Schools. I shall explain to you how we stand in these accounts. In the Royal Army Medical Corps Fund proper, that is to say, the funds including the Dinner, Memorial and Band, there was on June 1 last on deposit, £900, and we have to the credit of the current account £955 15s. 5d., making a total of £1,855 15s. 5d. We have in our General Relief Funds invested £1,093 6s. 9d., and to our credit in the current account, £287 4s., making a total of £1,380 10s. 9d. Then we have the Compassionate Schools Funds, with a deposit account of £1,000, and in the current account £32 18s., making a total of £1,032 18s. in all. In the three funds of the "Corps," Relief, and Schools Funds we have a total of £4,269 4s. 2d., and considering our Funds have only been in existence for five years, with a large expenditure from its very initiation, we may congratulate ourselves on the state of our finances.

I am asked by the Secretary to say how we stand with regard to the number of subscribers and so forth. As regards the Royal Army Medical Corps Funds proper, the total number of subscribers to the Funds for 1907 was 1,037, of which 178 were retired officers, and 861 on the active list. I am sorry to say that a very large number of officers on the active list do not subscribe to the Funds, doubtless for various reasons, but largely on account of their not being properly advised to join by the officers of their stations, and no doubt others again forget these things, and fail to fill in the banker's form, &c. These number some 200, you would hardly think so, but I assure you this is the case.

It will be remembered that at the Fifth General Meeting held last year there was a discussion on a proposal put forward by the Committee, "That seven members of the Committee will meet seven members appointed by the General Committee to consider the allotment of the subscriptions to the Royal Army Medical Corps Funds, with power to act on the decision." You will remember we have always been a little indefinite as to how we should allot our annual subscriptions; several changes have from time to time taken place, and I hope this last decision represents finality. As a matter of fact, I think the decision of the Committee will commend itself to you. I have therefore to announce to you that a special meeting was held on July 12, 1907, to decide whether there should be one universal subscription for all ranks, how we should allot our annual subscriptions, and the advisability of combining the Corps and Journal subscriptions. After much discussion these were the resolutions which were carried: (*a*) That the money subscribed to the Corps Funds shall be administered by the Committee as in their judgment may seem best; (*b*) that there shall be one universal subscription of £1 for all ranks; (*c*) that the Journal shall not be included in the same subscription as the Corps Fund.

At this Committee meeting it was a debatable question whether we should not pay according to our various ranks. There was much to be said on both sides, but I hope the decision of the Committee on this point will commend itself to you. Regarding the Journal, I feel myself it ought to be something special, and not to be included in the one subscription for the Royal Army Medical Corps Funds, so that if the Corps Fund ever lapses because of want of funds, our Journal, at all events, will continue to flourish. According to the powers given to the Committee, it was settled that the *pro rata* band subscription introduced in 1906 should cease, and that there should be no separate funds for Band, Dinner and Memorial. That is the best real economic condition I think.

With regard to the second Fund, the Memorial Fund, during the past year there have been several officers memorialised. First of all, poor Tulloch, who died of sleeping sickness under very sad circumstances, and whom we felt you would all like to commemorate. We therefore established a Medal in Pathology, to be called the "Tulloch Medal." As the prize has been given by our Fund, we have applied it only to our own officers. We have also sent to Mrs. Tulloch a facsimile of the medal in silver, and this, we also feel sure, will commend itself to you. Secondly, we have memorialised Guthrie; and we have also memorialised Surgeon-Major Williamson, whom I am sorry to say I had never heard of until Professor Thomson, of Oxford, on looking through our collection of skulls found a catalogue written in his time. Colonel Leishman tells me he has since discovered work done by Williamson in other directions. We propose to put up a brass plate over the collection and call it the "Williamson" collection, with a short account of the circumstances. I have endeavoured to ascertain where his relations are in order to convey the fact that we have at last recognised his merit, and have done what we can to perpetuate his memory. The next officer is Captain Douglas. Captain Douglas is still with us, and is possibly present, and I will not say anything to make him blush.

With regard to the Band, we have now a new Bandmaster. We regret Mr. Bennett had to leave us, but I believe the Committee have made an excellent arrangement regarding the new Bandmaster, and the Band continues to improve.

The third section of the Fund is the Dinner. Last year we had 203 present at the Corps Dinner, which was a record, but there was a paucity of junior officers present, which is a pity, as this absence is a drawback to them. To-night there will be a large number of Captains present, but only one Lieutenant. I am glad to announce the Dinner to-night will be a record, as we have 217 dining.

That concludes the Royal Army Medical Corps Fund proper. We now have the Widows' and Orphans' Fund to tell you about. That Fund since our last General Meeting has ceased to exist, as all the money has been expended, as we intended to expend it, and not invest any of it.

With regard to the General Relief Fund, this has been better supported by the regimental institutes than in former years. There is room for improvement, but no room to grumble.

The Union Jack Club has been opened, and we have arranged to pay a consolidated subscription of 24 guineas for the whole Corps from the General Relief Fund. I feel we ought to do the best for our men, their canteen grants help the fund largely. I believe our men make use of the Club to a considerable extent. We have founded two rooms in the Club, and altogether I feel we are doing something in paying their subscriptions.

With regard to the Schools, during the past year two children who have been maintained by us have left owing to their having attained the age limit, viz., 16 years for girls and 14 years for boys. Two boys have been admitted. At the present moment we have twenty children at school—seven maintained by payment, and thirteen admitted free. That is not a bad record, to be able to say we have twenty children looked after in schools in the country.

I now come to the Agenda of the day. I should explain, perhaps, that the Committee adopted a recommendation that a grant should be made annually to the General Relief Fund by the Annual Meeting, such grant to be determined by the state of the finances at the time. The Secretary suggests that for the present it would be sufficient if a sum of 10 guineas for General Relief for this year was voted, but I believe there is some difference of opinion, and we shall have some opportunity of hearing Colonel Wilson on that point. I now put before you the recommendation of the Committee that, "A grant be made annually to the General Relief Fund by the Annual General Meeting, such grant to be determined by the state of the finances at the time. The General Relief Fund had on June 1 last a balance of £287 in its current account. If it is decided to approve of this resolution it is suggested a grant of 10 guineas be made this year to the General Relief Fund." This was seconded by Surgeon-General Sloggett. Colonel Wilson stated that a sum of

10 guineas was insufficient to be annually devoted to the General Relief Fund, pointing out that now the Widows' and Orphans' Fund was closed there would be a call in that direction which would tax the Fund of the General Relief to such an extent that a considerable amount more than that recommended by the Committee would be required. The figures in the February number of the CORPS NEWS which contain the half-yearly accounts, would show this to be the case. Also as regards the School Fund the accounts seem to show that unless further funds in this direction were forthcoming, that in five or six years the children now at school would exhaust them, and we should be in a position of not being able to accept more children unless this Fund was augmented. Calculations on the accounts mentioned before pointed out that in a few years time £100 or more would be required per annum. In that time there would be a lot of new officers who would not understand the extraordinary jump from £10 10s. to £100. He suggested that the amount should be increased from the sum of 10 guineas up to the extent of £50 per annum; not necessarily to be drawn on at once, but to be at the disposal of the Committee should it be necessary. Surgeon-General Sir Thomas Gallwey pointed out that as the resolution now stood, it would, if passed, give ample latitude without binding to any specific sum. After a lengthy discussion an amended proposal was made by Colonel Wilson that the Committee themselves should have power to allot a sum up to £50 for General Relief, this sum being allotted to commence with the present year. This proposal was not seconded, and was consequently not put to the meeting. The original proposal by the Committee that a grant be made annually to the General Relief Fund by the Annual General Meeting, such grant to be determined by the state of the finances at the time, and that the grant for 1908-09 should be 10 guineas, was seconded by Colonel Nichol. Carried unanimously.

The Chairman: I will now call upon Colonel James to make a proposition. Colonel James. "As the Royal Army Medical Corps Mess in London is a Central Institution, and will continually entertain distinguished people, as well as occasionally bodies of scientific men whose knowledge is of great importance to the Corps at large, it is urged that the expenses which will be, and are, incurred by such entertainments should not fall entirely upon the officers for the time being living in the London Mess, but that they should be assessed against the Corps, and in default of a subscription to the Mess from every member of the Corps, that the Corps Fund should contribute to such entertainment by an annual grant in aid of the Mess." This was seconded by Colonel Beattie. Colonel Firth asked if it were not possible to have a donation of £3 from every officer, as laid down in the King's Regulations for the Royal Artillery and Royal Engineers. Colonel Macpherson proposed that Colonel James' resolution be amended to read as follows: "As the Royal Army Medical Corps Mess in London is a central institution, and will continually entertain distinguished people, as well as, occasionally, bodies of scientific men, whose knowledge is of great importance to the Corps at large, a grant not exceeding £50 shall be contributed towards such entertainment from the Corps Fund." This was seconded by Colonel Babtie and carried unanimously. Surgeon-General Sloggett proposed that the Committee of the Royal Army Medical Corps Fund should consist of thirteen members, nine on full pay and four on retired pay, of the former the Director-General and Deputy-Director-General should be respectively Chairman and Vice-Chairman of the Committee. That the tenure of office on the Committee of retired officers should be limited to four years, and that they should not be eligible for re-election until after a period of one year has elapsed from the retirement of this Committee. This was seconded by Colonel James. Carried unanimously.

A vote of thanks was then passed to the Chairman, and the meeting then terminated.

# ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

Minutes of proceedings of the Annual General Meeting held at 2.30 p.m., on June 15, 1908, in the Theatre of the Royal Army Medical College.

*Present.*

Surgeon-General Sir Charles Cuffe, K.C.B., Vice-President, in the chair.

Surgeon-General E. M. Sinclair; Colonel J. F. Lambkin; Major W. A. Ward; Colonel D. Wardrop; Colonel T. Ligertwood, C.B.; Surgeon-General A. T. Sloggett, C.M.G.; Colonel W. May, C.B.; Lieutenant Colonel R I. D. Hackett; Lieutenant-Colonel A. M. Davies: Lieutenant-Colonel H. D. Rowan; Major W. O. Beveridge; Lieutenant-Colonel Macpherson, C.M.G.; Lieutenant-Colonel R. H. Firth; Surgeon-General G. D. Burke, C B.; Colonel W. Johnson, C.B.; Lieutenant-Colonel H. T. Fletcher: Colonel W. T. Martin; Lieutenant-Colonel R. H. Hall.

(1) The minutes of the last Annual General Meeting were read and confirmed.

(2) Lieutenant-Colonel MacPherson proposed, and Lieutenant-Colonel Firth seconded, a resolution: "That in future reprints of the statement of accounts from the Corps News be provided for the information of those attending the General Meeting." Carried.

(3) Colonel Lambkin proposed and Colonel May seconded: "That the accounts for 1907 be approved." Carried.

(4) The Committee proposed that Lieutenant-Colonel E. M. Wilson, C.B., and Lieutenant-Colonel Poynder be elected to serve on the Committee *vice* Lieutenant-Colonels Davies and Cottell, retiring by rotation. Surgeon-General Sloggett proposed the name of Lieutenant-Colonel Firth; this was seconded by Surgeon-General Burke. On a vote being taken, Lieutenant-Colonel E. M. Wilson, C.B., and Lieutenant-Colonel Firth were elected.

(5) It was resolved on the proposal of Surgeon-General Burke, seconded by Surgeon-General A. T. Sloggett, that the following be elected Vice-Presidents for the ensuing year: Colonel T. Ligertwood, C.B., Surgeon-General Sir Charles Cuffe, K.C.B., and Colonel J. H. Whipple.

(6) Lieutenant Colonel Firth proposed. "That fuller information of the particulars and circumstances of the applicants should be circulated to those attending the General Meeting." This was seconded by Lieutenant-Colonel Rowan

Lieutenant-Colonel Macpherson proposed an amendment, which was seconded by Surgeon-General Sloggett, "That as all particulars were considered confidential, it was not desirable to make them public more than was necessary, and that the present system of having full particulars on the table, accessible to every member, was sufficient and should continue." On a show of hands the amendment was carried by 16 to 3. The resolution was lost.

(7) The following donations recommended by the Committee, for the present year, were sanctioned and agreed to, viz.: Three orphans of D. O. D., £30; orphan of R. D., £30; two orphans of C. Q., £25; orphan of A. J. S, £15, orphan of D. K. C., £20; two orphans of W. S. L., £20; orphan of R. W. T., £20; orphan of M. Q., £20; orphan of T. F., £20; orphan of O. A., £30; two orphans of H. W. M., £30 and McGrigor's Pension, £10; three orphans of E. E., £40; two orphans of W. J. C., £30; orphan of J. S., £10; orphan of H. J. C., £20; orphan of J. O., £25; orphan of W. I., £30; orphan of J. W. B., £25; two orphans of W. P. F., £30; orphan of T. B., £10. Total, £490.

(9) It was noted that a sum of £200 had been invested in Consols during the past year.

### Donations Granted during the Year 1907.

Three orphans of D. O. D., £50; orphan of R. D., £15; two orphans of C. Q., £18; orphan of J. F. B., £25, and McGrigor's Pension, £10; three orphans of W. K., £20; orphan of A. J. S., £25; orphan of J. H. C., £20; orphan of W. S. L., £25; orphan of R. W. T., £20; orphan of M. Q., £20; two orphans of J. B., £30: orphan of J. F., £20; orphan of D. A., £33 15s.; orphan of B. S., £25; two orphans of W. H. M., £20; three orphans of E. E., £30; four orphans of W. J. C., £30; orphan of A. S., £25; orphan of D. C., £25; orphan of T. O., £25; orphan of H. C., £25; two orphans of H. J. P., £16; orphan of T. B., £5; orphan of J. R, £10.

## ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

**Dr.** STATEMENT OF THE RECEIPTS AND EXPENDITURE FROM JANUARY 1 TO DECEMBER 31, 1907. **Cr.**

| RECEIPTS. | £ | s. | d. |
|---|---|---|---|
| To Balance in hand, December 31, 1906 | 123 | 14 | 1 |
| ,, Subscriptions and Donations | 177 | 19 | 0 |
| ,, One Year's Dividend on Debenture Stock L. & N.W. Railway (less tax £10) | 190 | 0 | 2 |
| ,, One Year's Dividend on Debenture Stock, North-Eastern Railway (less tax £10) | 189 | 19 | 8 |
| ,, One Year's Dividend, Debenture Stock Midland Railway (less tax £8) | 152 | 0 | 0 |
| ,, One Year's Dividend, Debenture Stock Caledonian Railway (less tax £5 11s. 2d.) | 105 | 12 | 10 |
| ,, One Year's Dividend on £222 11s. 1d., 2½ % Consols | 5 | 5 | 8 |
| | £944 | 11 | 5 |

| EXPENDITURE. | £ | s. | d. |
|---|---|---|---|
| By Weekly Payments authorised October 19, 1906 | 1 | 10 | 0 |
| ,, Donations at the Annual General Meeting | 475 | 10 | 0 |
| ,, ,, granted by Committee, January | 19 | 15 | 0 |
| ,, ,, ,, April | 5 | 0 | 0 |
| ,, ,, ,, July | 50 | 0 | 0 |
| ,, ,, ,, October | 16 | 0 | 0 |
| ,, Late Secretary's Salary, one Quarter | 12 | 10 | 0 |
| ,, Petty Cash to late Secretary | 0 | 2 | 5 |
| ,, Refund of Subscription | 1 | 1 | 0 |
| ,, Secretary's Salary, January 1 to September 30 | 28 | 2 | 6 |
| ,, Office Furniture | 7 | 11 | 6 |
| ,, Printing | 4 | 14 | 6 |
| ,, Clerical Assistance | 5 | 0 | 0 |
| ,, Postage | 2 | 5 | 7 |
| ,, Stationery | 3 | 14 | 5 |
| ,, Advertisement | 1 | 1 | 0 |
| ,, Bankers' Charges | 0 | 4 | 6 |
| ,, Purchase of £239 16s. 5d., 2½ % Consols | 200 | 0 | 0 |
| ,, Balance with Bank, December 31, 1907 | 100 | 19 | 0 |
| ,, Cash with Secretary | 9 | 10 | 0 |
| | £944 | 11 | |

| INVESTMENTS. | £ | s. | d. |
|---|---|---|---|
| L. & N.W. Railway 3 % Debenture Stock | 6,667 | 0 | 0 |
| Midland ,, 2½ % | 6,400 | 0 | 0 |
| N. Eastern ,, 3 % | 6,666 | 0 | 0 |
| Caledonian ,, 4 % | 2,780 | 0 | 0 |
| Consols, 2½ % | 462 | 7 | 6 |
| | £22,975 | 7 | 6 |

We have compared the above statement with the books and papers relating thereto, and certify the same to be correct. We have verified the balance at the Bank, and have inspected the Certificates of the Investments in Railway Stock as set out, and we are taking steps to verify the Consols inscribed at the Bank of England.

*Portland House, Basinghall Street,*
*January* 9, 1908.

EVANS, PIERSON & CO., *Chartered Accountants.*

## LIST OF SUBSCRIBERS FOR THE YEAR 1907.

Major S. A. Archer, 10s. 6d. : Miss Allan, £2; Lieutenant W. G. Aviss, £1 1s. ; Major E. T. F. Birrell, £1; Major W. T. Black, £1 1s. ; Colonel W. Babtie, C.M.G., £1 1s ; Lieut.-Col. F. J. Brodie, £1 1s. ; Major J. M. Buist, £1 1s. ; Lieut.-Col. J. Battersby, £1 ; Major T. B. Beach, £1 1s. ; Colonel G. D. Bourke, C.B., £1 1s. ; Captain C. A. J. Batch, £1 1s. ; Major F. W. Begbie, £1 1s. ; Lieut.-Col. A. F. Clarke, £1 1s. ; Dep.-Surg.-Genl. J. S. Comyn, £1 ; Captain E. Chandler, 5s. ; Major J. H. Campbell, £1 1s. ; Surg.-Genl. A. F. Churchill, £1 ; Lieut.-Col. H. E. Cree, £1 ; Lieut.-Col. A. B. Cottell, £1 ; Colonel T. M. Corker, £1; Major A. J. Chambers, £1 ; Major S. L. Cummins, £1 1s. ; Captain A. Chopping, £1 1s. ; Captain G. B. T. Churchill, £1 1s. ; Captain E. W. Cochrane, £1 1s. ; Lieut.-Col. G. Cree, £1 1s. ; Surg.-Genl. Sir Charles Cuffe, K.C.B., £1 1s. ; Captain J. T. Clapham, £1 1s. ; Major J. C. Connor, £1 1s. ; Major R. J. Copeland, £1 1s. ; Lieutenant F. H. M. Chapman, £1 1s. : Lieut.-Col. E. M. Davies, £1 1s. ; Colonel J. R. Dodd, £1 1s. ; Mrs. A. E. Davidson, £1; Surg.-Genl. W. Donovan, C.B., £1 1s. ; Surg.-Genl. J. G. H. Evatt, C.B., £1 ; Major P. Evans, £2 2s. ; Lieut.-Col. H. P. J. Elkington, £1; Colonel P. M. Ellis, £1 1s. ; Surg.-Genl. T. W. Fox, £1 ; Major A. A. Fitzgerald, £1 1s. ; Lieut.-Col. R. H. Firth, £1 1s. ; Surg.-Genl. W. Fawcett, C.B., £1 ; Major R. Freeman, £1 1s. ; Captain F. M. Foulds, £1 1s. ; Lieut.-Col. J. Forrest, £1 1s. ; Captain H. J. Fletcher, £1 1s. ; Surg.-Genl. C. H. Giraud, £1 1s. ; Major J. Girvin, £1 1s. ; Colonel W. Graves, £1 1s. ; Lieut.-Col. J. S. Green, £1 1s. ; Major J. J. Gerard, £1; Major G. T. Goggin, £1 ; Lieut.-Col. R. J. Geddes, £1 1s. ; Lieutenant R. W. Galwey, £1 1s. ; Captain J. E. H. Gatt, £1 1s. ; Col. R. J. D. Hackett, £1; Captain A. E. Hammerton, 10s. 6d. ; Lieut. Col. F. W. O'H. Hamilton, C.M.G., £1 : Major W. E. Hardy, £1 1s. ; Captain H. Herrick, £1 1s. ; Captain F. W. Hardy, £1 1s ; Major E. M. Hassard, £1 1s. ; Captain G. W. G. Hughes, £1 1s. ; Lieut.-Col. R. Holyoake, £1 1s. ; Lieut -Col. F. W. H. Davie Harris, £1 1s. ; Major W. H. Horrocks, £1 1s. ; Lieut.-Col. R. Jennings, £1 1s. ; Lieut.-Col. W. Johnston, £1 ; Dep.-Surg.-Genl. C. A. James, £1 1s. ; Colonel H. E. R. James, £1 1s. ; Major R. W. H. Jackson, £1 1s. ; Lieut.-Col. J. M. Irwin, £1 1s. ; Lieut.-Col. F. W. C. Jones, £1 1s. ; Colonel J. M. Jones, £1 1s. ; Major J. C. Jameson, £1 ; Lieut.-Col. R. Kirkpatrick, £1 1s. : Lieut -Col. M. Knox, £1 ; Director-Genl. Sir A. Keogh, £2 2s. ; Colonel W. Kenny, £1 1s. ; Captain W. D. C. Kelly, £3 3s. ; Colonel T. Ligertwood, £1 1s. ; Lady Longmore, £1 1s. ; Lieut.-Col. W. L. Lane, £1 ; Colonel G. W. N. Leake, £1 1s. ; Captain P. S. Lelean, £1 1s. ; Captain W. N. Long, £1 1s. ; Colonel W. T. Martin, £1 1s. ; Captain A. M. MacLaughlin, £1 1s. : Lieut.-Col. W. G. Macpherson, £1 1s. ; Major J. Moir, £1 ; Major W. T. Mould, £1 ; Colonel H. W. Murray, £2; Lieut.-Col. H. S. McGill, £1 1s. ; Lieut. A. A. McNeight, £1 1s. ; Colonel W. A. May, £1 1s. ; Surg.-Genl. W. H. McNamara, £1 1s. ; Colonel F. J. McNeece, £1 1s. ; Major E. L. McSheehey, £1 1s. ; Major F. M. Mangin, £1 ; Captain A. J. McDougal, £1 1s. ; Captain T. C. MacKenzie, £1 1s. ; Major G. S. MacLoulin, £1 1s. ; Lieut.-Col. R. N. Macpherson, £1 1s. ; Lieut.-Col. C. W. S. Magrath, £1 1s. ; Major C. B. Martin, £1 1s. ; Colonel H. Martin, £1 1s. ; Lieut.-Col. H. J. R. Moberley, £1 1s. ; Captain A. H. Morris, £1 1s. ; Lieut.-Col. E. O. Milward, £1 1s. ; Colonel C. G. Mosse, £1 1s. ; Colonel J. Lane Notter, £1 ; Captain G. S. Nickerson, £1 1s. ; Major H. I. Pocock, £1 1s. ; Major C. E. Pollock, £1 1s. ; Major F. J. W. Porter, £1 1s. ; Captain C. W. Profeit, £1 1s. ; Lieut. W. S. M. Price, £1 1s. ; Major H. S. Peake, £1 1s. ; Lieut.-Col. G. F. Poynder, £1 1s. ; Major Ian Paterson, £1 1s. ; Lieut.-Col. E. J. E. Risk, £1 1s. ; Lieut.-Col. H. D. Rowan, £1 1s. ; Surg.-Gen. S. B. Roe, £1 1s. ; Lieut. G. F. Rugg, £1 1s. ; Lieut.-Col. C. C. Reilly, £1 ; Dep.-Surg.-Genl. E. M. Sinclair, £2 2s. ; Major A. E. Smithson, £1 1s. ; Colonel C. Seymour, £1 1s. ; Lieut.-Col. J. F. M. Symons, £2 ; Captain H. C. F. Stallard, £1 ; Major G. Scott, £1 1s. ; Captain E. P. Sewell, £1 1s. ; Lieut.-Col. B. Skinner, £1 1s. ; Lieut.-Col. A. A. Sutton, £1 1s. ; Colonel A. T. Sloggett, £1 : Major C. G. Spencer, £1 1s. ; Major H. E. Staddon, £1 1s ; Major E. B. Steel, £1 1s. ; Captain F. A. Stephens, £1 1s. ; Captain M. Swabey, £1 1s., Major C. E. C. Stalkartt, £1 1s. ; Lieut. J. A. B. Sims, £1 1s. ; Surg.-Gen. T. W. Trevor, £1 1s ; Surg.-Gen. Sir E. Townsend, £1 1s. ; Lieut.-Col. C. J. W. Tatham, £1 1s. ; Lieut.-Col. H. O. Trevor, £1 1s. ; Lieut.-Col. J. E. Twiss, £1 1s. ; Lieut.-Col. R. J. Windle, £1 ; Lieut.-Col. J. B. Wilson, £1 1s. ; Colonel D. Wardrop, £1 1s. ; Lieut.-Col. J. G. Williamson, £1 1s. ; Lieut.-Col. T. P. Woodhouse, £1 1s. ; Surg.-Gen. J. A. Woolfreyes, £1 1s. ; Colonel H. R. Whitehead, £1 1s. ; Captain A. D. Waring, £1 1s. ; Captain B. Watts, £1 1s. ; Lieut.-Col. G. E. Weston, £1 1s. ; Lieut.-Col. E. M. Wilson, £1 1s. ; Captain M. G. Winder, £1 1s. ; Miss Ethel L. Warren, £1 1s. ; Major J. C. Weir, £1 1s. ; Captain A. H. O. Young, £1 1s.

# BIRTH.

LONGHURST.—On May 9, at North Front Camp, Gibraltar, the wife of Major Longhurst, R.A.M.C. of a daughter.

# DEATHS.

HANBURY.—On June 2, 1908, at Bournemouth, Surgeon-Major-General Sir James Arthur Hanbury, K.C.B., M.B., F.R.C.S.I., retired, aged 76. He entered the Service September 30, 1853; was promoted Surgeon, February 20, 1863; Surgeon-Major, Army Medical Department, March 1, 1873; Brigade-Surgeon, November 27 1879; Deputy Surgeon-General, May 5, 1881; Surgeon Major General, June 14, 1887. His war services are as follows: Afghan War, 1878-79 80.—Bazar Valley Expedition, march from Kabul to the relief of Kandahar, and battle of September 1. Despatches, *London Gazette*, November 7, 1879, and December 3, 1880. Medal with clasp; bronze star, C.B. Egyptian Expedition, 1882. Held the appointment of Surgeon-General (local rank) while employed as Principal Medical Officer in Egypt. Battle of Tel-el-Kebir. Despatches, *London Gazette*, October 6 and November 2, 1882. Medal with clasp; bronze star; Second Class Medjidie, K.C.B. A Distinguished Service Reward was conferred on Sir J. A. Hanbury in February, 1905.

MARTIN.—On June 4, 1908, whilst on leave in Japan, Colonel Henry Martin, M.B., A.M S., was drowned, aged 50. He entered the Service March 6, 1880; was seconded for service on Personal Staff of Governor of Bombay, February 26, 1890; was promoted Surgeon-Major, Medical Staff; seconded March 6, 1892; Major, Royal Army Medical Corps, from seconded list September 14, 1899; Lieutenant-Colonel, March 6, 1900; selected for increased pay under Act 365, pay-warrant, April 16, 1902; Colonel, December 18, 1905. His war services are as follows: Zhob Valley Expedition, 1884. South African War, 1899-1902.—Operations in Natal, 1899, including actions at Elandslaagte, Rietfontein and Lombard's Kop. Defence of Ladysmith, including action of January 6, 1900. Operations in Natal, March to June, 1900, as Principal Medical Officer, 5th Division. Afterwards in charge of a General Hospital. Despatches, Sir G. S. White, December 2, 1899, and March 23, 1900; Sir R. H. Buller, November 9, 1900. *London Gazette*, February 1, 1901. Queen's medal with 3 clasps; King's medal with 2 clasps.

MERRY.—On June 3, 1908, at Switzerland, Captain Frederick Hallard Merry, M.B., Royal Army Medical Corps, aged 34. He entered the Service December 4, 1899; was promoted Captain, Royal Army Medical Corps, December 4, 1902; placed on temporary half-pay on account of ill-health, December 7, 1907. His war services are as follows: South African War, 1899-1902.—Operations in the Orange Free State, February to May, 1900, including operations at Paardeberg, actions at Poplar Grove and Karee Siding. Operations in Orange River Colony, May to November 29, 1900. Operations in Orange River Colony, November 30, 1900, to January, 1902. Operations in Cape Colony, January to February, 1902. Queen's medal with 2 clasps; King's medal with 2 clasps.

O'BRIEN.—On May 19, 1908, at Campden Hill Square, London, Honorary Brigade-Surgeon Thomas Butler Power O'Brien, retired, Army Medical Department, aged 76. He entered the Service September 29, 1875; was promoted Surgeon, Staff, August 4, 1870; Surgeon-Major, Army Medical Department, March 1, 1873. Retired with the honorary rank of Brigade-Surgeon, June 2, 1886.

VEALE.—On May 22, 1908, at Reading, Honorary Deputy Surgeon-General Henry Richard Lobb Veale, M.D., retired, Army Medical Department, aged 76. He entered the Service August 14, 1855; was promoted Surgeon, Staff, February 26, 1870; Surgeon-

Major, Army Medical Department, March 1, 1873; Brigade-Surgeon, Army Medical Department, July 27, 1881. Retired with honorary rank of Deputy-Surgeon-General, January 2, 1883. His war services are as follows: Indian Mutiny, 1857-8.—Relief of Lucknow (severely wounded); defeat of Gwalior Contingent at Cawnpore. Medal with clasp. Egyptian Expedition 1882. Medal; bronze star.

## EXCHANGE.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is* 5/- *for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd.,* 8, *Serle Street, London, W.C., not later than the* 22*nd of the month.*

# Notices.

## EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only, they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," Royal Army Medical College, Millbank, London, S.W.

Communications have been received from Colonels F. J. Lambkin and D. Wardrop. Lieutenant-Colonels W. G. Macpherson, C.M.G., A. E. Morris, F. Davie Harris, W. A. Morris, and N. Manders. Majors E. T. F. Birrell, H. C. French, J. G. McNaught, F. J. W. Porter, D.S.O., and R. J. Blackham. Captains C. Ryley, F. H. Hardy, J. W. Houghton, and S. M. W. Meadows. Lieutenants W. G. Aviss, and H. H. B. Cunningham (M.). Dr. J. A. Arkwright. Fleet-Surgeon W. W. Pryn, R.N.

The following periodicals have been received:—

*British: British Medical Journal, Lancet, Medical Press and Circular, Army and Navy Gazette, Australasian Medical Gazette, Hospital, Journal of Tropical Veterinary Science, Indian Medical Gazette, Royal Engineers' Journal, Guy's Hospital Gazette, St. Thomas's Hospital Gazette, Journal of the Royal Sanitary Institute, Medical Review, Proceedings of the Royal Society of Medicine, Red Cross and Ambulance News, Public Health, Journal of Tropical Medicine and Hygiene, On the March* (Journal of the R.A.T.A.), *St. Bartholomew's Hospital Journal, Middlesex Hospital Journal, Journal of the Royal Institute of Public Health, Medical Press and Circular, Journal of the Royal United Service Institution, Collected Papers of the Lister Institute of Preventive Medicine, The Transvaal Medical Journal, The All-India Hospital Assistants' Journal.*

*Foreign: Der Militärarzt, Norsk Tidsskrift for Militærmedicin, Bulletins and Circulars of the Bureau of Animal Industry* (U.S.A.), *Bulletin de l'Institut Pasteur, Military Surgeon* (U.S.A.). *Archiv für Schiffs und Tropen-Hygiene, Le Caducée, Annali di Medicina Navale, Bulletin of the Johns Hopkins Hospital, Giornale di Medicina Militaire, Archives de Médecine et de Pharmacie Militaires, American Medicine, Russian Military Medical Journal, Tidskrift i Militar Halsovard, Archives de Médecine Navale.*

# MANAGER'S NOTICES.

The Journal of the Royal Army Medical Corps is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

**Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 25th of each month.**

**It is requested that all Cheques or Postal Orders for Subscriptions to the Journal, Corps News, Reprints, &c., be crossed "Holt & Co.," and made payable to the "Hon. Manager, Journal R.A.M.C.," and not to any individual personally.**

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The Hon. Manager,
"Journal of the Royal Army Medical Corps,"
War Office, Whitehall, S.W.

# JOURNAL
OF THE
# ROYAL ARMY MEDICAL CORPS.

## Corps News.

August, 1908.

### ARMY MEDICAL SERVICE.—GAZETTE NOTIFICATIONS.

Lieutenant-Colonel Louis E. Anderson, from the Royal Army Medical Corps, to be Colonel, *vice* H. Martin, deceased, dated June 5, 1908.

Surgeon-General William L. Gubbins, C.B., M.V.O., M.B., to be Deputy Director-General, *vice* Surgeon-General W. J. Fawcett, C B., M.B., dated June 24, 1908.

### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Bernard L. Mills, M.D., retires on retired pay, dated June 17, 1908. He entered the Service January 30, 1886; was promoted Surgeon-Major Army Medical Staff January 30, 1898; Lieutenant-Colonel Royal Army Medical Corps. January 30, 1906. His war services are as follows: N.W. Frontier of India, 1897-8; Malakand, operations in Bajaur and in the Mamund Country; Buner, Attack and capture of the Tanga Pass. Medal with clasp. South African War, 1899-1901. Queen's Medal with 5 clasps.

Major George Raymond, M.B., retires on retired pay, dated June 27, 1908. He entered the Service, February 5, 1887: promoted Major February 5, 1899; Major, Royal Army Medical Corps, with higher rate of pay under Article 365, P. W., February 5, 1907. His war services are as follows: Operations in Sierra Leone, 1898-9; Mendiland Expedition. Medal with clasp. South African War, 1899-1901; operations in the Orange Free State February to March, 1900; operations in the Transvaal, July, 1900; operations in the Orange River Colony, June, 1900. Queen's medal with 3 clasps.

Captain Lewis J. C. Hearn, M.B., from temporary half-pay, is placed on retired pay, dated June 27, 1908. He entered the Service July 28, 1897; was promoted Captain Royal Army Medical Corps July 28, 1900; placed on temporary half-pay on account of ill-health June 27, 1903. His war services are as follows: Nile Expedition, 1898. Egyptian Medal, Medal. Operations in Sierra Leone 1898-9. Medal with clasp.

Captain Thomas Biggam, M.B., from temporary half-pay, to be Captain, with precedence next below T. E. Fielding, M.B., dated June 26, 1908.

Lieutenant-Colonel George D. Hunter, D.S.O., from the seconded list, to be Lieutenant-Colonel, dated July 5, 1908.

Lieutenant-Colonel Joseph Gibson, M.B., retires on retired pay, dated July 15, 1908. He entered the Service on February 5, 1881; was promoted Surgeon-Major on February 5, 1893; Lieutenant-Colonel Royal Army Medical Corps on February 5, 1901. His war services are as follows: Burmese Expedition, 1885-7. Medal with clasp. South African War, 1900-02. Operations in the Transvaal August to November, 1900. Operations in Cape Colony, south of Orange River, 1900. Operations in the Transvaal, 1901-2. Queen's Medal with 3 clasps; King's Medal with 2 clasps.

**ARRIVALS HOME ON LEAVE.**—From India: Majors W. J. Taylor, C. W. Duggan, J. W. Jennings; Captain R. J. Cahill. From Jamaica: Lieutenant-Colonel C. G. W. Mosse; Lieutenant P. Farrant. From Gibraltar: Major A. F. Tyrrell; Lieutenant H. E. Priestly. From Malta: Majors C. B. Lawson, A. E. Master. From Egypt: Lieutenant-Colonel J. F. Donegan. From Bermuda: Captain A. H. O. Young.

**ARRIVALS HOME.**—Time expired: Surgeon-General W. L. Gubbins, C.B., M.V.O., from India; Surgeon-General W. Donovan, C.B., from South Africa.

**EMBARKATIONS.**—Captain D. L. Harding (from sick leave) for India; Lieutenants W. R. Galway and J. H. Gurley for Egypt.

**APPOINTMENTS.**—Lieutenant-Colonel G. D. Hunter, D.S.O., Medical Inspector of Recruits, Aldershot.

**EXCHANGES.**—Captains F. J. Palmer and J. H. Barbour, L. N. Lloyd, D.S.O., and H. Herrick.

**POSTINGS.**—Lieutenant-Colonel G. D. Hunter to Aldershot Command. Major J. Girvin to London District. Captain T. Biggam to Western Command. Captain N. H. Ross to Aldershot.

**SERVICE ABROAD.**—Changes in list of officers required: Lieutenant E. J. Elliot for North China (additional) instead of Mauritius. Lieutenant G. F. Rudkin for Southern Army, India. Lieutenant T. H. Scott for Northern Army, India. Lieutenant J. du P. Langrishe for Northern Army, India. Lieutenant L. A. A. Andrews for Mauritius, *vice* Lieutenant Elliot. Lieutenant M. O. Wilson for Southern Army, India.

Major W. W. O. Beveridge, D.S.O., has received an extension of two years in his appointment at the Royal Army Clothing Depôt.

Captain R. H. Lloyd, having been appointed Adjutant in the Territorial Force, will not be available to proceed abroad.

## LIST OF CAPTAINS TO JOIN ROYAL ARMY MEDICAL COLLEGE ON AUGUST 1, 1908, FOR A COURSE OF STUDY.

| Names | Command | Names | Command |
|---|---|---|---|
| Captain R. S. H. Fuhr, D.S.O. | Southern. | Captain B. B. Burke | Eastern. |
| ,, J. E. Hodgson | ,, | ,, D. J. F. O'Donoghue | Irish. |
| ,, P. C. Douglass | ,, | ,, T. B. Unwin | ,, |
| ,, J. S. Bostock | ,, | ,, P. G. Hyde | ,, |
| ,, L. T. F. Winslow | ,, | ,, R. C. Wilson | ,, |
| ,, A. J. Williamson | ,, | ,, G. Baillie | ,, |
| ,, M. W. Falkner | ,, | ,, A. R. Greenwood | Aldershot. |
| ,, C. R. L. Ronayne | Northern. | ,, A. A. Seeds | ,, |
| ,, C. R. Evans | ,, | ,, R. F. M. Fawcett | ,, |
| ,, J. B. Clarke | ,, | ,, A. H. M. Mitchell | Western. |
| ,, E. E. Parkes | Eastern. | ,, R. M. Skinner | Scottish. |
| ,, A. W. Gibson | ,, | ,, H. A. Bransbury | London. |
| ,, B. S. Bartlett | ,, | | |

## DISTRIBUTION OF THE LIEUTENANTS ON PROBATION, R.A.M.C.—FIRST JUNIOR COURSE, 1908.

| Names | Command | Names | Command |
|---|---|---|---|
| Lieutenant A. L. Foster | Aldershot. | Lieutenant J. James | Eastern. |
| ,, R. O. Kelly | ,, | ,, C. M. Rigby | ,, |
| ,, W. J. Tobin | ,, | ,, A. C. H. Suhr | ,, |
| ,, A. H. T. Davis | Northern. | ,, A. G. Wells | ,, |
| ,, A. Shepherd | ,, | ,, F. Worthington | ,, |
| ,, J. E. Ellcombe | Southern. | ,, F. H. Bradley | Western. |
| ,, A. E. G. Fraser | ,, | ,, J. R. Lloyd | ,, |
| ,, L. Murphy | ,, | ,, H. H. Blake | Scottish. |
| ,, B. Varvill | ,, | ,, R. M. Dickson | ,, |
| ,, C. Cassidy | Netley. | ,, T. S. Eves | Irish. |
| ,, F. B. Dalgliesh | ,, | ,, J. F. Grant | ,, |
| ,, C. E. L. Harding | ,, | ,, J. W. Houston | ,, |
| ,, G. J. Keane | ,, | ,, F. M. Hewson | ,, |
| ,, J. S. McCombe | ,, | ,, C. McQueen | ,, |
| ,, W. H. S. Burney | Eastern. | ,, C. P. O'Brien-Butler | ,, |
| ,, W. J. Dunn | ,, | ,, A. L. Stevenson | ,, |
| ,, M. Leckie | ,, | | |

**LIST OF CASUALTIES:—**

*Discharges.*—8531 Staff-Serjeant F. L. Harsant, June 23, 1908, medically unfit; 7799 Staff-Serjeant H. Porter, June 29, 1908, termination of second period; 7800 Staff-Serjeant C. M. Blanchetts, July 1, 1908, termination of second period; 7790 Serjeant W. G. Elcombe, June 15, 1908, termination of second period; 7805 Corporal A. J. Williams, July 6, 1908, termination of second period; 17872 Corporal C. R. Thorp, July 7, 1908, medically unfit; 19090 Bugler F. W. Slater, July 7, 1908, medically unfit; 17802 Private R. Lee, June 2, 1908, medically unfit; 11092 Private A. Taylor, June 28, 1908, termination of first period.

*Transferred to Army Reserve.*—14288 Corporal W. C. Raynor, June 10, 1908; 18131 Corporal W. Greenhalgh, June 26, 1908; 14336 Lance-Corporal J. McIlveen, June 20, 1908; 14296 Private A. Manser, June 12, 1908; 19643 Private A. Solomons, June 12, 1908; 14289 Private J. Neill, June 11, 1908; 19642 Private J. C. Dale, June 12, 1908; 19645 Private B. R. Brooker, June 13, 1908; 19649 Private H. Bryant, June 15, 1908; 14293 Private W. E. Eaton, June 14, 1908; 19655 Private N. F. Nichols, June 19, 1908; 19656 Private G. H. Hewitt, June 19, 1908; 19654 Private J. Duncan, June 18, 1908; 19658 Private C. A. W. Gilbert, June 20, 1908; 19659 Private H. Grant, June 21, 1908; 19666 Private A. Honour, June 23, 1908; 15845 Private B. Poutney, June 25, 1908; 19662 Private O. W. Woodward, June 23, 1908; 19661 Private E. Gill, June 23, 1908; 19669 Private T. Joyce, June 27, 1908; 15847 Private J. Humphries, June 26, 1908; 14349 Private H. E. Aprile, June 28, 1908; 12867 Private R. Watling, June 30, 1908; 19670 Private A. E. A. Fry, June 28, 1908; 14355 Private G. W. Snell, June 28, 1908; 19681 Private J. Dunne, July 6, 1908; 19692 Private T. S. Mooney, July 14, 1908.

*Transfers from other Corps.*—8991 Staff-Serjeant R. Cox, July 1, 1908, from Transvaal Medical Corps; 1841 Private S. E. Fielding, June 19, 1908, from 5th Dragoon Guards; 1847 Private R. W. Ogg, July 1, 1908, from 2nd Scottish Rifles; 1848 Private A. V. Martins, July 1, 1908, from Royal Field Artillery; 1849 Private H. McKay, July 1, 1908, from 1st Black Watch.

*Transfers to other Corps.*—8417 Quartermaster-Serjeant J. Davis, June 29, 1908, Instructor to 3rd South Midland Field Ambulance; 7564 Quartermaster-Serjeant W. Ward, June 30, 1908, Instructor to 2nd Wessex Field Ambulance; 9083 Staff-Serjeant A. G. Bright, June 8, 1908, Instructor to 2nd Home Counties Field Ambulance; 8510 Staff-Serjeant W. H. Butler, July 6, 1908, Instructor to 1st North Midland Field Ambulance; 17287 Serjeant W. Stevens, June 19, 1908, Instructor to 1st Highland Field Ambulance; 19893 Private T. W. G. Rogers, July 21, 1908, 9th Lancers.

*Appointments.*—19960 Boy R. G. Grizzell, May 27, 1908, to be Bugler.

*Disembarkations from Abroad.*—11505 Private F. D. Grahame, June 23, 1908, from Bermuda per s.s. "Oruro"; 19522 Private J. Easton, June 11, 1908, from Malta, per H.M.S. "Crescent."

### The Following N.C.O.'s and Men have Qualified for Promotion in the various Corps Examinations.

*For Quartermaster-Serjeants.*—9737 Staff-Serjeant E. Bennett; 10116 Staff-Serjeant T. Clements; 9632 Staff-Serjeant J. Baxter; 10009 Staff-Serjeant J. D. Genese.

*For Staff-Serjeants.*—8477 Serjeant G. G. Gregson; 10009 Staff-Serjeant J. D. Genese.

*For Serjeants.*—9737 Staff-Serjeant E. Bennett; 18915 Corporal A. E. Barrett; 12583 Corporal H. Ebbs; 16810 Corporal M. P. Miller; 14359 Corporal J. G. Thomas; 16266 Corporal R. S. Talbot.

*For Corporals.*—18988 Private R. H. T. Haigh; 19595 Private C. E. Bull; 848 Private E. A. Carey; 14671 Private E. W. Brunton; 19980 Private H. J. Loder; 18296 Private H. Turnbull; 19080 Private J. S. Cave; 12618 Private W. A. Mayman.

The following have qualified as Dispensers:—15591 Corporal J. Harris, 16557 Private J. Doughty, 15312 Corporal G. Gillespie, 18656 Private H. G. Maywood, 9351 Corporal G. Howard, 18122 Corporal J. A. Kirby, 18763 Private F. J. Smith, 17937 Corporal P. A. Kirby, 18453 Corporal F. A. Philbrook (very good), 18893 Private G. H. Green, 12129 Corporal S. M. Barnes, 16446 Lance-Corporal W. Whitehead, 12583 Corporal H. Ebbs (good), 16440 Corporal R. Kildea, 12926 Corporal A. D. Gordon, 18678 Corporal L. S. Ellis, 14359 Corporal J. G. Thomas, 18604 Corporal W. Tindall (very good), 16097 Corporal E. Bowen, 19029 Private R. E. Harvey (very good).

**NOTES FROM CHATHAM.**—Serjeant-Major H. F. Ford writes (July 14, 1908):—"The annual outing of the Non-Commissioned Officers' Mess, No. 10 Company, R.A.M.C., took place on Friday, July 10, 1908, under very favourable conditions (practically the whole of the Mess and their families attended). Although there were one or two slight showers during the day, it was nothing to hurt, as everyone was bent on enjoying themselves. The party drove in brakes from Chatham to Yalding, passing through Cuxton, Halling, Snodland, to West Malling, where a halt was made for a light lunch, &c. From there they proceeded through the Mereworth Woods, Wateringbury (hop district) to Yalding, the Anchor Hotel being the rendezvous. After indulging in boating up the Medway, a splendid tea, to which everyone did justice, was provided in a marquee. After tea a most enjoyable smoking concert was indulged in for a couple of hours prior to the return journey.

"PROGRAMME.

| | | |
|---|---|---|
| *Overture* | | Serjt. HADDON. |
| *Song* | 'Last Roll Call' | Corpl. NICHOLAS. |
| *Song* | 'Happy Moments' | Barrack Wdn. BARNES. |
| *Song* | 'A Bird in a Gilded Cage' | Corpl. HARLEN. |
| *Song* | 'Mona' | Serjt. CUDMORE. |
| *Song* | 'Lamerton and John' | Serjt. SAUNDERS. |
| *Encore Song* | 'King Cole' | Serjt. SAUNDERS. |
| *Song* | 'Galloping Major' | Serjt. HUGHES. |
| *Encore Song* | 'But with my barrow and my moke all day' | Serjt. HUGHES. |
| *Song* | 'Annie Laurie' | Corpl. ROSS. |
| *Duet* | 'Genevieve' | Corpls. GIBSON and HARLEN. |
| *Song* | 'Patsy Eagan' | Corpl. HUGHES. |
| *Song* | 'If those lips could only speak'<br>(Own accompaniment.) | Miss HADDON. |
| *Song* | 'Kathleen' | Mrs. MUSCATELL. |
| *Song* | 'Viking' | Corpl. MUSCATELL. |
| *Accordion Selection* | | Corpl. HUGHES. |

"The return journey was made by a different route, viz., through Wateringbury, Teston, Barming, Maidstone and Blue-bell Hill, the whole of the country looking at its very best. The party arrived home about 11 p.m., after enjoying a thoroughly good day."

**NOTES FROM CORK.**—Captain R. N. Woodley writes (June 19, 1908): "A Smoking Concert was given at the Headquarters of No. 16 Company on March 9, the occasion being the much regretted retirement from the Service of Serjeant-Major B. G. Brook, who served with the Corps for a period of twenty-three years, during which time he much endeared himself to those serving under him. The concert was opened at 8 p.m., the chair being taken by Staff-Serjeant Hurrell. The Commanding Officer, Lieutenant-Colonel G. J. Coates, and the other officers of the Corps stationed at Cork, were present during the evening. The Chairman opened the proceedings of the evening by reminding us, in a short speech, for what purpose we were assembled. The first half of the programme was then proceeded with. During the interval refreshments were served, and the Colonel presented the guest of the evening with various presents which had been displayed in a very prominent manner to the right of the platform, the chief of these being a handsome tea and coffee service, and a beautiful case of silver-mounted pipes, from the officers of the Company, a massive case of cutlery from the Warrant Officer, non-Commissioned officers and men. The Colonel, in a very eloquent and touching speech, spoke with regret of the great loss the Corps sustained on the retirement of this very popular Warrant Officer. Going on to refer to the past service of Serjeant-Major Brook, he upheld him as a model for all young soldiers of the Corps. As a Warrant Officer for many years he had worthily upheld the dignity of that rank, and yet had endeared himself to all with whom he served. At the conclusion of the Colonel's speech the health of Serjeant-Major and Mrs. Brook who was present, was drunk with musical honours. Serjeant-Major Brook replied, thanking the Colonel and all ranks of the Company, both present and absent, for the presents and their kindly wishes for his future prosperity. He spoke with much sorrow and regret of his severing his connection with the Corps, and especially with the friends he had made in No. 16 Company. At this point, cheering and applause almost caused the speaker to break down with emotion: then, to the strains of that old familar tune 'For He's a Jolly Good Fellow,' he was carried shoulder high amongst the gathering. After the cheering had subsided, the audience composed themselves to listen to the second half of an excellent programme. The evening's entertainment was brought to a close by a vote of thanks to Staff-Serjeant Hurrell for the able manner in which he occupied the chair, and the great trouble he had taken in arranging and organising the concert and presentation.

"PROGRAMME.

*Part I.*

| | | |
|---|---|---|
| 1. | *Song* | Corpl. CRANDLE, R.A.M.C. |
| 2. | *Piano*<br>*Mandoline* Trio<br>*Violin* | Staff-Serjt. HURRELL,<br>Corpl. MOLLOY, R.A.M.C.,<br>Lance-Corpl. SHAW, 2nd D.L.I. |
| 3. | *Comic Song* | Pte. FISHER, R.A.M.C. |
| 4. | *Song* | Mr. J. DRUMMY. |
| 5. | *Clarinet Solo* | Corpl. WONFOR, 2nd D.L.I. |
| 6. | *Song* | Pte. JAMIESON, R.A.M.C. |
| 7. | *Song* | Serjt. HOPKINS, R.A.M.C. |
| 8. | *Cornet Solo* | Band Serjt. LLOYD, 2nd D.L.I. |
| 9. | *Recitation* | Lieut. WHITEHORN, R.A.M.C. |
| 10. | *Song* | Pte. MACDONALD, R.A.M.C. |

Interval for presentation by Lieutenant-Colonel G. J. Coates, R.A.M.C.

*Part II.*

| | | |
|---|---|---|
| 11. | *Song* | Staff-Serjt. HURRELL, R.A.M.C. |
| 12. | *Clarinet Solo* | Corpl. WONFOR, 2nd D.L.I. |
| 13. | *Song* | Pte. HENDERSON, R.A.M.C. |
| 14. | *Song* | Corpl. MOLLOY, R.A.M.C. |
| 15. | *Song* | Pte. BARNEY, R.A.M.C. |
| 16. | *Cornet Solo* | Band Serjt. LLOYD, 2nd D.L.I. |
| 17. | *Song* | Pte. FISHER, R.A.M.C. |
| 18. | *Song* | Pte. DEAN, R.A.M.C. |
| 19. | *Song* | Lieut. ANDERSON (R.A.) |
| 20. | *Song* | Pte. WRIGHT, R.A.M.C. |
| 21. | *Song* | Pte. YOUNG, R.A.M.C. |

'GOD SAVE THE KING.'

"G. HURRELL, *Staff-Serjt., for Committee.*"

**NOTES FROM TIDWORTH.**—Lieutenant Chapman writes (July 15, 1908): "Tidworth still continues to be the scene of constant changes among the Medical Staff, the number of officers at present amounting to twelve. However, the frequency of camps in this district of strenuous soldiering, and the consequent calls on this station for the provision of Medical Officers, had, previous to this accession of strength, sadly depleted our numbers. Excitements are few. The cricket week, however, at the end of last month was a great success, and hospitality was dispensed by each unit in glorious weather. On no day was the ground better attended than on Thursday, June 25th, when the Royal Army Medical Corps, in conjunction with the staff details and departments, were 'at home.' Mr. Haldane has paid us two visits recently. On the first occasion he was present at an open-air church parade, and after the service presented the medal for long service and good conduct to, amongst other Non-Commissioned Officers of the garrison, Serjeant Piercy, R.A.M.C. His last visit, on Saturday, July 4, was made in order that he might open the new Soldiers' Institute, recently completed and named after General Sir Ian Hamilton, and which is to provide the place of recreation for the men, which has hitherto been conspicuous by its absence.

"The following is a list of officers doing duty at this station: Colonel M. W. Kerin, A.M.O.; Lieutenant-Colonel C. F. Faunce, Officer in Charge of Hospital; Major A. C. Fox, Officer in Charge of Families; Captain M. F. Foulds, Company Officer; Captain H. B. Connell, from Netley, for temporary duty; Lieutenant F. J. Elliott; Lieutenant J. A. Bennett, from Portsmouth for temporary duty; Lieutenant H. M. Chapman; Lieutenant D. F. Mackenzie; Lieutenant B. Sardill, Lieutenant A. F. G. Fraser and Lieutenant L. Murphy, from Royal Army Medical College."

**NOTES FROM MALTA.**—Major C. E. Pollock writes (July 9, 1908): "On June 15 Mrs. Jennings gave a farewell entertainment to the detachment Royal Army Medical Corps, Valletta, and the patients in hospital. Tables were laid at the shady side of the upper square, and an excellent tea was provided, at which the officers, their wives and the sisters attended on the guests. When the repast was finished, tables were cleared away and chairs moved up into a circle round an improvised stage; smokes were handed round and the concert began. I enclose the programme. Several items had to be unavoidably altered at the last moment, but the audience did not lose by this, as Miss Christopherson and the Rev. Blackbourne, S.C.F., gave us several songs, which were very highly appreciated. The sketch was most entertaining, well written, and well acted; it fairly fetched the house. Privates Plume and Woolway especially distinguished themselves. The evening concluded with a hearty vote of thanks to Mrs. Jennings for her kind thought in providing the entertainment. Our cricket team has not as yet distinguished itself in the way we hoped it would. Of four matches played during the last month we lost three. In the Governor's Cup matches we retired in the first round after a bad beating, a 'rot' having set in early and continued unabated to the sad end. Our greatest want at present is change bowlers; may we discover them speedily!

"Majors C. B. Lawson and A. E. Master and Captain H. Winckworth have proceeded on leave, while Major C. M. Fleury, Captain H. St. M. Carter, and Lieutenant T. H. Gibbon have returned to the sunny shores of Malta after a rest at home.

"PROGRAMME.

| | | |
|---|---|---|
| *Pianoforte Solo* | .. .. .. .. .. | Pte. PRESTON, 1st Suffolk Rt. |
| *Song* .. .. .. | 'Tally O! the Tally Man' | Pte. GROGAN, R.A.M.C. |
| *Song* .. .. .. .. .. | Selected .. .. | Miss CHRISTOPHERSON. |

"SKETCH.

"'*The Prince and the Tinker.*'

| | | | |
|---|---|---|---|
| *Prince* .. .. .. | Pte. BLUNDELL. | *Tinker* .. .. .. | Pte. PLUME. |
| *French Chef* .. .. | Pte. WOOLWAY. | *Secretary* .. .. | Pte. HUGHES. |
| *Butler* .. .. .. | Pte. GROGAN. | *Groom* .. .. .. | Serjt. GRAY. |

*Servants, &c.*

| | | |
|---|---|---|
| *Violin Solo* | .. .. .. .. .. .. .. .. .. | Pte. WALTON. |
| *Song* .. .. .. .. .. | Selected .. .. .. .. .. | Pte PLUME. |

'GOD SAVE THE KING.'"

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, Secretary to Principal Medical Officer, His Majesty's Forces in India, writes (June 18, 1908):—

"*Appointments.*—Surgeon-General W. B. Slaughter has been appointed to officiate as Principal Medical Officer, His Majesty's Forces in India, pending the arrival of Surgeon-General F. W. Trevor, C.B. Colonel J. G. Harwood has been appointed to officiate as Principal Medical Officer, 8th (Lucknow) Division, *vice* Surgeon General Slaughter. Lieutenant-Colonel W. W. Pike has been appointed to officiate as Principal Medical Officer, Presidency and Assam Brigades, *vice* Colonel Harwood. Colonel O. Todd has been appointed, *sub-pro tem.*, Principal Medical Officer, 9th (Secunderabad) Division. Lieutenant-Colonel M. W. O'Keefe has been appointed to act as Principal Medical Officer, 1st (Peshawar) Division, during the absence of Colonel Whitehead on leave. Lieutenant-Colonel T. J. O'Donnell will act as Officer Commanding, Station Hospital, Rawalpindi, *vice* Lieutenant-Colonel O'Keefe. Lieutenant-Colonel S. Westcott has been recalled from leave in India to carry on duties of Principal Medical Officer, 5th (Mhow) Division.

"Following officers have been appointed Honorary Surgeons to His Excellency the Viceroy: Lieutenant-Colonel G. E. Hale, D.S.O.; Major C. Dalton.

"*Leave.*—Colonel H. R. Whitehead has been granted six months and nineteen days' general leave, ex-India, from July 13, 1908.

"Following officer has been granted medical certificate leave: Major L. A. Mitchell, from May 31, 1908, to August 20, 1908.

"*Specialists.*—The following officer is appointed specialist in (*e*) Electrical Science, with effect from May 1, 1908: 6th (Poona) Division, Lieutenant W. C. Smales."

**NOTES FROM SOUTH AFRICA.**—Lieutenant-Colonel O'Halloran writes (June 6, 1908): "The undermentioned officer, on arrival from Mauritius, took up the appointment of Administrative Medical Officer, Cape Colony District: Colonel A. Peterkin.

"The following changes have taken place amongst Q.A.I.M.N.S.: Sister Miss E. Beck, to Military Hospital, Maritzburg, from Army Headquarters, Pretoria; Sister Miss E. C. Cheetham, to Army Headquarters, as Secretary to Principal Matron, South Africa, from Military Hospital, Roberts' Heights, Pretoria; Sister Miss M. E. Harper has been posted to Military Hospital, Wynberg, Cape Colony, on return from leave."

**NOTES FROM SECUNDERABAD.**—Captain R. H. MacNicol, R.A.M.C., writes (June 10, 1908): "Not within the memory of the oldest inhabitant has there been such a trying and hot season as we have gone through since February last. The thermometric readings recorded a daily maximum temperature of from 6° to 10° higher than last year, yet '*mirabile dictu*,' the health of the station is wonderful, as there are less than a hundred patients in hospital, including about 1 per cent. for venereal diseases. Our new Principal Medical Officer, Colonel F. Maclean, A.M.S., arrived on May 12, and was recently entertained at dinner by the officers of the Royal Army Medical Corps and Indian Medical Service at the Secunderabad Club. Our Officer Commanding, Lieutenant-Colonel Battersby, has had a successful month's shoot with the conservator of forests, in H.H. the Nizam's preserves, total bag, six tigers, two panthers, one bear, and a 41-inch sambhur head. Two tigers were bagged in one beat by our Commanding Officer, and he would probably have added a third (a fine tigress) had not the gun on his right made her plunge under his machan, affording only a snapshot. Lieutenant-Colonel Freyer, C.M.G., has also been out, and so far, I hear, his party has accounted for two tigers, two tigresses, and a few panthers.

"The monsoon has not yet burst, but there are indications of its near approach. We are glad to welcome Major Hale, D S.O., back again, looking very fit after six months' leave to England. Captain Wiley left us last month for duty at Wellington; we do not yet know who his successor will be."

**NOTES FROM KHARTOUM.**—Lieutenant Heron writes (June 19, 1908): "There have been wars and rumours of wars recently at this end of the world. A British inspector foully murdered by a would-be Mahdi; native police with three native officers cut to pieces, together with an English officer killed and two other English officials wounded. And all this by a handful of dervish rebels, led by a fanatic Mahdi, one Abdul Kader. He and his followers, a hundred strong, crept upon the camp by night and speared the police and the officials as they lay in the open asleep on their native beds, and if they had kept quiet they would have slain the lot. But the alarm was raised and a company of a Soudanese regiment, under the command of a gallant Soudanese officer, opened fire and drove the rebels off. Thus was a widespread revolt averted; one success by a Mahdi in this country against the Turks, as they call us and all oppressors, means that thousands flock to his standard.

"The British Camel Corps, consisting of about eighty sturdy Royal Dublin Fusiliers, were sent out to Kamlin, sixty miles south of Khartoum, near which place the trouble arose, and the would-be Mahdi was tried and hanged by the neck, and many of his followers were also hanged and the rest disposed of for life.

"Imagine a flat, glaring expanse of sand, without a tree, without a patch of green, as far as the eye can see on one side of the desert track, and on the other a few thorn bushes, half a dozen date palms and innumerable flat-topped mud hovels with one or two whitewashed houses amongst them, and you have Kamlin. No wonder the natives rebel, any man would rebel against Nature, or anything else, at Kamlin with a temperature 110° in the shade. The Camel Corps remained a fortnight and returned by two days' trek to Khartoum, encountering on the way, besides exhausting heat, one thunderstorm, continual sandstorms and one haboob, a kind of glorified sandstorm, like as it were a London fog consisting of sand, with half a gale blowing at the same time. Such is the land of Ham, ruled by the British for His Eminence the Khedive.

"Khartoum, a pleasant spot full of fine buildings and shady gardens, extends along the bank of the Blue Nile for about three miles before its junction with the White Nile. The barracks are the 'last word' in comfort, fitted with such luxuries as electric light and fans, and fringed with cool verandahs. The hospital contains seventy-five beds and is well provided with all the comforts the energetic Senior Medical Officer, Lieutenant-Colonel Donegan, can procure. The only things we lack are patients, to such a state of healthiness has Khartoum been brought. Lieutenant G. Ferguson, R.A.M.C., relieved Lieutenant Heron, R.A.M.C., early in June, and 'takes over' when the present Senior Medical Officer goes on leave."

**NOTES FROM PESHAWAR.**—Lieutenant O'Brien writes (July, 1908): "The existence of Peshawar must be quite unknown to the readers of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS if the frequency of the appearance of 'Notes' is any criterion as to the amount of knowledge gained. However, now that, for the past two months, the eyes of the world have been turned towards the 'Garden City of the Punjab' and its great mobilisation powers, would it not be well if readers of the Journal should learn a little about our own doings from those within?

"The past year has seen many changes in the ranks. Colonels Chester and Keron have gone and been replaced by Colonels Whitehead and Nichols. Lieutenant-Colonel Mathias went to climes of greater usefulness, and Major Clarke, having plunged into matrimony, qualified to take up his residence in that delightful station, Nowshera. Majors Julian and McDowell are now numbered amongst Peshawar's oldest inhabitants.

"Apart from this the mess is in a flourishing condition, and we have had, on the average, eight or nine dining members. Of course, during the Mohmand and Bazaar Valley Expeditions we saw many faces from all parts of the country, and many men, who had not met since their student days, sat long with the port and lived their lives again—in words.

"We have had a great opportunity with two expeditions in one year, and even our youngest subaltern can now talk about battles and the transportation of the wounded in hill warfare; still, apart from our own personal gain, it has been a very exciting year to us all, and one in which a great deal of experience has been gained.

"The social doings of the station have not been at all remarkable during the year, as both British regiments changed, and we had not quite settled down when we were all ordered out on active service. Epidemic matrimony has exacted its toll amongst the members of the mess, and even at the present moment the subscription list hangs in the ante-room waiting to be filled with the names of those willing to subscribe, &c.

"To conclude, a list of the officers in the station, and their different functions, appears to be the correct thing. Colonel Whitehead is Principal Medical Officer and is now at Cherat, but we hear he goes home shortly. Lieutenant-Colonel Nichols is Senior Medical Officer, and so remains at Peshawar during the hot weather. Major Julian is Senior Medical Officer at Cherat, but at the time of writing is in Simla on a Commission endeavouring to deal with the vexed and much discussed question of field ambulances. Major McDowell is the lucky man away on leave, and Captain Chopping, as X-ray Specialist, controls the medical destinies of the station. Lieutenants Edmunds and O'Grady, fresh from England, are now doing duty at the Station Hospital, and incidentally experiencing the first tastes of the hot weather and its attendant evils. Captain Davidson, the Divisional Sanitary Officer, is, as usual, busy with reports, and eagerly looking forward to the day when he sails, at the beginning of the cold weather, for England."

**NOTES FROM PRETORIA.**—Lieutenant-Colonel M. O'Halloran writes (July 4, 1908): "Before leaving South Africa, Surgeon-General W. Donovan, C.B., was entertained at dinner on May 18, at the Pretoria Club, by the Headquarters Staff, Artillery Barracks. General Sir A. Dorward, M.G.A., proposed his health in a very fitting and eloquent manner. The reply of our guest was in the same felicitous strain.

"Again on May 20, 1908, Surgeon-General Donovan and his Staff were the guests at a farewell dinner given by Lieutenant-Colonel Sawyer and the officers, Royal Army Medical Corps, at their Mess, Roberts' Heights. All officers were present. After dinner Colonel Sawyer, in a short speech, proposed the health of the departing guest, who replied, eulogising the services of the officers serving under him.

"The final leave-taking was at the railway station, where General Sir A. Dorward with a number of officers and their wives (though the hour for seeing him off cut into our dinner) assembled to say good-bye. His departure is deeply regretted, and he carries the good wishes of all, both civil and military. With a diminishing garrison and rumours of still further reductions, it is the earnest hope of the 'reduced ones' to have the pleasure of serving under him before long in the Old Country—to use a time-honoured expression, 'if the exigencies of the Service permit.'

"I am pleased to add that Colonel W. W. Kenny, A.M.S., whose name is shortly expected to appear in the *Gazette* on promotion, has assumed the duties of Principal Medical Officer, South Africa, and we are most fortunate in the selection.

"Colonel G. W. Robinson, A.M.S., has just arrived to take over the duties of Administrative Medical Officer, Transvaal, Orange River Colony, and Natal.

"Captain Dunkerton, R.A.M.C., has rejoined at Roberts' Heights, from leave to England."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, R.A.M.C., writes (July, 1908): "We regret to have to record a distressing accident to Miss M. A. Garriock, R.R.C., Principal Matron, South Africa, who was visiting here on inspection duty. Arriving from Pretoria on June 26, Miss Garriock, who was the guest of Lieutenant-Colonel Hickson, Officer Commanding, was on the following morning driving to the railway station, when her trap collided with a cart from the opposite direction, resulting in the unfortunate lady being thrown violently against the roadside kerb and becoming unconscious. Assistance was immediately forthcoming, and on arrival at the Wynberg Military Hospital it was found she had sustained a compound dislocation of the ankle, with fracture of the fibula. The necessary measures were promptly taken, and as this mail leaves Miss Garriock's condition is much improved. Needless to say, the sympathy of all ranks has been freely forthcoming for the Principal Matron, who, since her arrival in this country, has secured the esteem of the whole hospital *personnel* of South Africa.

"On July 1 the members of the Serjeants' Mess gave an excellent dance in the Wynberg Town Hall. The large hall used for dancing had been artistically decorated by Serjeant-Major Kinsella and his energetic Committee, while the stage and annexes, embellished with palms and foliage, furnished cosy nooks for sitting-out. The dance music of twenty-four items was furnished by the full band of the Worcestershires, under the personal direction of Mr. J. G. Worms, Bandmaster, to whom the Mess owe a debt of gratitude for his time and attention to this very necessary detail. Quartermaster-Serjeant Moffat, Staff-Serjeant Heming, and Serjeant Hazell made most efficient M.C.'s., 'wallflowers,' through their persuasive powers, being quite the exception.

"Some 170 guests attended, including Colonel Peterkin, A.M.O., Lieutenant-Colonel and Mrs. Hickson, Major and Mrs. and Miss Merritt, Major and Mrs. McNaught, Major and Mrs Collins, Lieutenant Forsyth, R.A.M.C., Lieutenants Holden and Burridge, A.S.C. and A.O.C., Lieutenants Phelips, Pelly, Clarke, and Collins, Worcestershires; Garrison Serjeant-Major and Mrs. Blake, and members of the various Cape Peninsula Serjeants' Messes, with a good sprinkling of civilian friends. The absence of the General Officer Commanding and family at Kimberley unfortunately precluded their attendance, while the Mayor and Mayoress of Wynberg had previously received a 'command' to Government House.

"During an interval a most *recherché* supper, served by Mr. H. S. Boffey, of the Royal and Lord Milner Hotels, was much appreciated, fully justifying the Committee's selection of a caterer.

"Dancing was kept going with spirit till 2 a m., when a special tram conveyed the Cape Town visitors to their homes, opinions being unanimous as to the success of the function. The Matron and Ladies of the Nursing Service were unfortunately, owing to Miss Garriock's illness, precluded from attending.

"We are still going strong on hockey, having twice met local teams, the 'Nomads' and the 'Rovers' With the first-named we drew (3—3), but were beaten by the last-named (6—1). The 'Rovers' being 'At Home' to us on the first occasion, the compliment was returned, tea, &c., being served on the ground, under the capable management of Serjeant Hurst. In the Rovers' match we were victorious (5—2)."

## QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following ladies have received appointments as Staff Nurse: Miss E. B. Levay, Miss E. V. Forrest.

*Postings and Transfers.*—Sisters: Miss M. Steenson, to Millbank, from Portsmouth; Miss M. Worthington, to Edinburgh, from Millbank; Miss J. W. Wilson, to Edinburgh, from Military Hospital, Dover; Miss H. M. Drage, to Cambridge Hospital, Aldershot, from Netley; Miss E. Foster, to Netley, from Dover; Miss D. D. Tripp, to Cosham, on return from Egypt; Miss M. Pedler, to Dover, from Aldershot; Miss M. E. Richardson, to Woolwich, from Hounslow; Miss M. L. Potter, to Hounslow, from Woolwich. Staff Nurses: Miss G. E. Browning, to Cosham, on appointment; Miss I. D. Humfrey, to Woolwich, on appointment; Miss M. C. Tawbey, to Cambridge Hospital, Aldershot, on appointment; Miss N. I. Jordan, to Devonport, on appointment; Miss A. I. Buyers, to Netley, on appointment; Miss M. Fisher, to Dover, from Netley; Miss F. M. Tosh, to Cairo, on arrival in Egypt.

*Promotion.*—The here mentioned Staff Nurse to be Sister: Miss K. Roscoe.

*Appointment Confirmed.*—Staff Nurse: Miss C. M. Hodson.

## ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Captain Richard H. Luce, M.B., to be Surgeon-Major, dated June 17, 1908.

Surgeon-Captain William P. Peake to be Surgeon-Major, dated June 17, 1908.

Surgeon-Major John A. Jones to be Surgeon-Lieutenant-Colonel, dated January 17, 1908.

Surgeon-Lieutenant Frederick E. Bissell, M.D., to be Surgeon-Captain, dated June 30, 1908.

## ROYAL ARMY MEDICAL CORPS (MILITIA).

Captain William K. Steele to be Major, dated April 6, 1908.

Lieutenant Frederick E. Bissell, M.D., to be Captain, dated June 3, 1908.

## ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

*Scottish Command, Glasgow Companies.*—Quartermaster and Honorary Lieutenant James D. Walker resigns his commission, dated March 31, 1908.

## IMPERIAL YEOMANRY.

*Leicestershire (Prince Albert's Own).*—Surgeon-Captain Walter W. Nuttall resigns his commission, dated March 31, 1908.

## VOLUNTEERS.

*1st Cinque Ports Volunteer Rifle Corps.*—Surgeon-Captain Henry J. Holman resigns his commission, dated March 31, 1908.

*1st Gloucestershire (Gloucester and Somerset).*—Surgeon-Captain Alexander Ogilvy, M.D., resigns his commission, dated March 31, 1908.

*3rd Volunteer Battalion, The Gloucestershire Regiment.*—Surgeon-Captain Frederick St. J. Bullen resigns his commission, dated March 31, 1908.

*2nd Volunteer Battalion, The Prince of Wales's Volunteers (South Lancashire Regiment).*—Supernumerary Surgeon-Major Frederick J. Knowles (Brigade Surgeon-Lieutenant-Colonel Senior Medical Officer South Lancashire Volunteer Infantry Brigade) to be Surgeon-Lieutenant-Colonel, remaining Supernumerary, dated March 24, 1908.

*1st Berwickshire.*—Surgeon-Lieutenant Irvine K. Hermon, M.D., resigns his commission, dated March 31, 1908.

*2nd Volunteer Battalion, The Hampshire Regiment.*—Surgeon-Lieutenant-Colonel Arthur B. Wade, M.B., is granted the honorary rank of Surgeon-Colonel, dated March 30, 1908.

Surgeon-Lieutenant-Colonel Arthur B. Wade, M.B., resigns his commission, with permission to retain his rank, and to wear the prescribed uniform, dated March 31, 1908.

Surgeon-Lieutenant Herbert G. Harris resigns his commission, dated March 31, 1908.

## TERRITORIAL FORCE. VOLUNTEERS. ROYAL ARMY MEDICAL CORPS.

*Yorkshire Mounted Brigade Field Ambulance.*—Captain William Kitson Clayton, from the South Yorkshire Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Captain (Honorary Captain in the Army) George Gardner Oakley, from the West Yorkshire Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant Alexander Wetherhead French, from the South Yorkshire Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, dated April 1, 1908.

*1st Northumbrian Field Ambulance.*—Surgeon-Captain John Clay, M.B., from the 2nd Volunteer Battalion, The Northumberland Fusiliers, to be Major, dated April 1, 1908.

Surgeon-Captain Frederick Newman Grinling, from the 2nd Volunteer Battalion, the Northumberland Fusiliers, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Frank Hawthorne, M.D., from the 1st Newcastle-on-Tyne Royal Garrison Artillery (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

John Maxwell Gover to be Lieutenant, dated April 1, 1908.

James Willie Heslop to be Lieutenant, dated April 25, 1908.

James Percy Milne to be Lieutenant, dated April 25, 1908.

William Simpson to be Lieutenant, dated April 25, 1908.

Frederick George Armstrong, dated April 25, 1908.

*2nd Northumbrian Field Ambulance.*—Surgeon-Captain Laurence James Blandford, M.D., from the 1st Volunteer Battalion, the Durham Light Infantry, to be Major, dated April 1, 1908.

The undermentioned officers from the 1st Volunteer Battalion, the Durham Light Infantry, to be Lieutenants, with precedence as in the Volunteer Force :—

Surgeon-Lieutenant Henry Carden Pearson, M.B., dated April 1, 1908.

Surgeon-Lieutenant Duncan Alexander Cameron, M.B., dated April 1, 1908.

Surgeon-Lieutenant Douglas Vercoe Haig, M.D., dated April 1, 1908.

Surgeon-Lieutenant David Leonard Fisher, M.B., dated April 1, 1908.

Surgeon-Lieutenant George Greig Farquhar, M.B., dated April 1, 1908.

James Donald Sinclair, M.B., to be Lieutenant, dated April 1, 1808.

Alfred Johnson to be Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*3rd Northumbrian Field Ambulance.*—Surgeon-Major Henry George Falkner, from the 1st Volunteer Battalion, the East Yorkshire Regiment, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain Arthur Tinsley Sissons, M.B., from the 1st Volunteer Battalion, the East Yorkshire Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

The undermentioned officers, from the 1st Volunteer Battalion, the East Yorkshire Regiment, to be Lieutenants, with precedence as in the Volunteer Force :—

Surgeon-Lieutenant Oswald Lucas Appleton, dated April 1, 1908.

Surgeon-Lieutenant Percy Roberts Ash, dated April 1, 1908.

*1st West Riding Field Ambulance.*—Captain Algernon Edward Luke Wear, M.D., from the Northern Command, Leeds Companies, Royal Army Medical Corps, (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Lieutenant Alexander Dunstan Sharp, from the Northern Command, Leeds Companies, Royal Army Medical Corps (Volunteers), to be Captain, dated April 1, 1908.

Surgeon-Lieutenant Alexander Brodie Seton Stewart, from the 2nd (Leeds) Yorkshire (West Riding) Royal Engineers (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

James Ewing to be Lieutenant, dated July 1, 1908.

Quartermaster and Honorary Captain Wilson Gardner, from the Northern Command, Leeds Companies, Royal Army Medical Corps (Volunteers), is appointed Transport Officer, with the honorary rank of Captain, dated April 1, 1908.

Transport Officer and Honorary Captain Wilson Gardner is granted the honorary rank of Major, dated April 2, 1908.

*2nd West Riding Field Ambulance.*—Captain William McGregor Young, M.D., from the Northern Command, Leeds Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

The following officers from the Northern Command, Leeds Companies, Royal Army Medical Corps (Volunteers), to be Captains, dated April 1, 1908 :—

Lieutenant Harold Collinson, M.B.

Lieutenant Frederick Whalley, M.B.

Quartermaster and Honorary Lieutenant James Boswell, from the Northern Command, Leeds Companies, Royal Army Medical Corps (Volunteers), is appointed Quartermaster with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*North Midland Mounted Brigade Field Ambulance.* — Surgeon-Captain Thomas Thompson, from the 1st Volunteer Battalion, The South Staffordshire Regiment, to be Major, dated April 1, 1908.

Arthur Avent to be Lieutenant, dated May 8, 1908.

*1st North Midland Field Ambulance.* — Captain and Honorary Major Richard Harman Luce, M.B., from the Sherwood Foresters Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Captain William James Reid, from the Sherwood Foresters Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant Ernest Arnold Wraith, from the Sherwood Foresters Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

William Millington Moreton is appointed Quartermaster, with the honorary rank of Lieutenant, dated May 21, 1908.

*2nd North Midland Field Ambulance.*—Captain William Pemberton Peake, from the Leicester and Lincoln Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

The following officers, from the Leicester and Lincoln Bearer Company, Royal

Army Medical Corps (Volunteers), are appointed to the Field Ambulance with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain Montague Shirley Wyatt Gunning.

Lieutenant Alastair MacGregor.

James Robert Plant to be Lieutenant, dated April 1, 1908.

Thomas Spibey is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*3rd North Midland Field Ambulance.*—Captain Howard Henry Congreve Dent, M.B., F.R.C.S. (Eng.), from the Staffordshire Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Bertram Joseph Tottey Ford is appointed Transport Officer, with the honorary rank of Lieutenant, dated April 9, 1908.

John King is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 13, 1908.

*1st South Midland Field Ambulance.*—Captain Arthur Roscoe Badger, from the Worcester and Warwick Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Surgeon-Captain Cyril Henry Howkins, from the 1st Volunteer Battalion, The Royal Warwickshire Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant George William Craig, from the Worcester and Warwick Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Seymour Gilbert Barling, from the 1st Volunteer Battalion, The Royal Warwickshire Regiment, to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Cyril Reginald Lunn, M.B., to be Lieutenant, dated April 1, 1908.

William Malcolm Sturrock, M.B., to be Lieutenant, dated April 1, 1908.

William McCall, M.B., to be Lieutenant, dated April 1, 1908.

*2nd South Midland Field Ambulance.*—Surgeon-Major Charles Thomas Griffiths, from the 1st Volunteer Battalion, The South Staffordshire Regiment, to be Lieutenant-Colonel, dated April 1, 1908.

William Algernon Louis Holland to be Lieutenant, dated April 1, 1908.

John Henry Holding to be Lieutenant, dated April 1, 1908

Alfred Alwyne Hingston to be Lieutenant, dated April 1, 1908.

William Harold Kimpton is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*3rd South Midland Field Ambulance.*—Surgeon-Lieutenant-Colonel Arthur William Prichard (Brigade Surgeon-Lieutenant-Colonel, Senior Medical Officer, Portland Volunteer Infantry Brigade), from the 1st (City of Bristol) Volunteer Battalion, The Gloucestershire Regiment, to be Lieutenant-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain James Young, M.D., from the 1st (City of Bristol) Volunteer Battalion, The Gloucestershire Regiment, to be Major, dated April 1, 1908.

Bertram Mitford Heron Rogers, M.D., to be Lieutenant, dated April 1, 1908.

James Smith Mather, M.B., to be Lieutenant, dated April 1, 1908.

Thomas Arthur Green, M.D., to be Lieutenant, dated April 1, 1908.

Percy Moxey to be Lieutenant, dated April 1, 1908.

Henry Lambert is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*3rd Home Counties Field Ambulance.*—Major and Honorary Lieutenant-Colonel John James de Zouche Marshall, from the East Surrey Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

*Lowland Mounted Brigade Field Ambulance.*—Captain Robert Taylor Halliday, M.B., from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

The undermentioned officers, from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Captains, with precedence as in the Volunteer Force, dated April 1, 1908:—

Captain Hugh Wright Thomson, M.B.

Captain James Bruce, M.B.

Captain Robert Yuill Anderson, M.B.

Surgeon-Captain Farquhar Gracie, M.B., from the 1st Dumbartonshire Volunteer Rifle Corps, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant Robert Buchanan Carslaw, Transport Officer, from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), is appointed Transport Officer, with the honorary rank of Lieutenant, dated April 1, 1908.

*1st Lowland Field Ambulance.*—Major William Francis Somerville, M.D., from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant Colonel, dated April 1, 1908.

The undermentioned Officers from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Captains, with precedence as in the Volunteer Force, dated April 1, 1908:—

Captain George Henry Edington, M.D.
Captain Archibald Young, M.B.
Captain James Walker, M.B.
Captain William Bryce, M.D.

Captain William Cochrane Murray, M.B., from the Argyll and Sutherland Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant John Wilson Leitch, from the 3rd Lanarkshire Volunteer Rifle Corps, to be Captain, dated April 1, 1908.

Lieutenant Archibald Jubb, M.D., from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Captain, dated April 1, 1908.

Lieutenant Brownlow Riddell, M.D., from the Argyll and Sutherland Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, dated April 1, 1908.

Quartermaster and Honorary Captain James Kenny, from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), is appointed Quartermaster, with the honorary rank of Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*2nd Lowland Field Ambulance* --Surgeon-Major Alexander Dryden Moffat, from the 3rd (The Blytheswood) Volunteer Battalion, The Highland Light Infantry, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain Peter Fleming Shaw, from the 1st Volunteer Battalion, The Highland Light Infantry, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain John McKie, M.B., from the 5th (Glasgow Highland, Volunteer Battalion, The Highland Light Infantry, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

The undermentioned officers from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Captains, with precedence as in the Volunteer Force, dated April 1, 1908:--

Captain Matthew Dunning, M.B.
Captain William Adam Burns.

Lieutenant James Alexander Hamilton Aitken, M.B., from the Highland Light Infantry Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant James King Patrick, M.B., from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant David Shannon, M.B., from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Quartermaster and Honorary Captain William Lee, from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), is appointed Quartermaster with the honorary rank of Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*2nd Welsh Field Ambulance.*—Captain Alfred William Sheen, M.D., from the Welsh Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Captain Evelyn John Robert Evatt, M.B., from the Welsh Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain Charles Richardson White, from the 3rd Volunteer Battalion, The Welsh Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant Henry Thomas Samuel, from the Welsh Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, dated April 1, 1908.

Athol Stewart Joseph Pearse to be Lieutenant, dated April 18, 1908.

George Morley Arundel Thomas to be Lieutenant, dated April 23, 1908.

*3rd West Riding Field Ambulance.*—Surgeon-Major Thomas Stewart Adair, M.B., from the 1st (Sheffield) Yorkshire (West Riding) Royal Engineers (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Frederick Augustus Hadley (late Surgeon-Captain, 13th Battalion, Imperial Yeomanry) to be Captain, dated April 1, 1908.

John Wilfred Stokes to be Lieutenant, dated April 1, 1908.

Herbert George Murdoch Henry to be Lieutenant, dated April 1, 1908.

Ernest Frederick Finch to be Lieutenant, dated April 6, 1908.

Charles Graham Murray to be Lieutenant, dated April 10, 1908.

Edward Fretson Skinner to be Lieutenant, dated April 11, 1908.

## MEMORANDUM.

THE following are the probable dates on which officers will embark for service abroad. These dates will be adhered to as far as service exigencies permit.

### NORTHERN ARMY, INDIA.

| | | | | | |
|---|---|---|---|---|---|
| Lieut.-Col. | E. Butt | Jan. 6. | Captain | P. S. O'Reilly (Exchange) | Jan. 20. |
| ,, | W. A. Morris | Nov. 18. | ,, | W. R. Blackwell | Dec. 16. |
| ,, | M. O. D. Braddell | Jan. 20. | ,, | J. Matthews | Jan. 6. |
| ,, | H. N. Thompson, D.S.O. | Nov. 18. | ,, | B. F. Wingate | Nov. 4. |
| ,, | H. J. Fletcher | Dec. 2. | ,, | A. H. Safford | Dec. 2. |
| ,, | S. Powell | Sept. 17. | Lieutenant | A. H. Heslop | Feb. 17. |
| ,, | W. B. Day | ,, 30. | ,, | D. M. Corbett | ,, 3. |
| Major | M. P. C. Holt, D.S.O. | ,, ,, | ,, | W. E. C. Lunn | ,, ,, |
| ,, | H. I. Pocock | Dec. 2. | ,, | W. W. Boyce | ,, ,, |
| ,, | J. C. Weir | Oct. 16. | ,, | D. Coutts | ,, ,, |
| ,, | C. W. R. Healey | Jan. 20. | ,, | F. L. Bradish | Sept. 17. |
| ,, | S. H. Withers | Nov. 18. | ,, | C. W. Bowle | ,, ,, |
| ,, | E. C. Anderson, D.S.O. | Dec. 2. | ,, | W. F. Loughnan | ,, ,, |
| ,, | A. G. Thompson | ,, 16. | ,, | W. I. Thompson | ,, ,, |
| ,, | R. J. Blackham | Nov. 4. | ,, | D. T. McCarthy | Feb. 17. |
| ,, | F. E. Gunter | Jan. 20. | ,, | E. C. Phelan | Sept. 4. |
| ,, | S. A. Archer | Dec. 16. | ,, | C. H. Denyer | ,, ,, |
| Captain | B. Watts | Sept. 30. | ,, | A. C. Elliott | ,, ,, |
| ,, | J. D. G. Macpherson | ,, ,, | ,, | F. Casement | ,, ,, |
| ,, | L. E. L. Parker | ,, ,, | ,, | E. M. Middleton | ,, ,, |
| ,, | J. G. Gill | Jan. 20. | ,, | T. H. Scott | ,, ,, |

Lieutenant J. du P. Langrishe .. Sept. 17.

### SOUTHERN ARMY, INDIA.

| | | | | | |
|---|---|---|---|---|---|
| Lieut.-Col. | R. J. Geddes, D.S.O. | Jan. 20. | Captain | H. Herrick (Exchange) | Nov. 18. |
| ,, | T. H. F. Clarkson | Feb. 17. | ,, | H. F. Shea | Dec. 16. |
| Major | J. W. Bullen | Oct. 16. | ,, | E. F. Q. L'Estrange | ,, 2. |
| ,, | C. W. R. Healey (Exchange) | Jan. 20. | Lieutenant | E. B. Lathbury | Feb. 17. |
| | | | ,, | C. Scaife | ,, 3. |
| ,, | J. C. Connor | ,, 6. | ,, | M. J. Lochrin | ,, ,, |
| ,, | D. D. Shanahan | Nov. 4. | ,, | E. D. Caddell | ,, ,, |
| ,, | C. W. H. Whitestone | Feb. 3. | ,, | J. R. Foster | ,, ,, |
| ,, | M. Swabey | Nov. 4. | ,, | O. C. P. Cooke | ,, ,, |
| ,, | F. J. Wade Brown | Dec. 16. | ,, | G. P. A. Bracken | Sept. 17. |
| ,, | E. W. Slayter(Exchange) | Nov. 18. | ,, | J. A. Bennett | ,, ,, |
| ,, | R. F. E. Austin | Jan. 6. | ,, | H. L. Howell | ,, ,, |
| ,, | J. Girvin | Dec. 16. | ,, | T. W. Browne | ,, ,, |
| ,, | E. W. Bliss | ,, 2. | ,, | C. Kelly | ,, ,, |
| ,, | S. W. Sweetnam | Sep. 4. | ,, | J. J. O'Keeffe | Sept. 4. |
| Captain | E. T. Inkson, V.C. | Nov. 18. | ,, | W. B. Purdon | ,, ,, |
| ,, | W. P. Gwynn | Oct. 16. | ,, | H. W. Farebrother | ,, ,, |
| ,, | G. M. Goldsmith | Nov. 4. | ,, | G. F. Rudkin | ,, ,, |
| ,, | H. K. Palmer | Oct. 16 | ,, | M. O. Wilson | Feb. 17. |
| ,, | J. H. Barbour | ,, ,, | ,, | R. D. O'Connor | ,, ,, |
| ,, | H. M. Nicholls | Jan. 6. | ,, | O.R. McEwan | ,, ,, |

*For Attachment for Antityphoid Treatment to Battalions Proceeding to India.*

| | | | |
|---|---|---|---|
| Lieutenant A. C. Amy.. .. | Jan. 20. | Lieutenant B. Johnson .. | Sept. 30. |
| " W. Mitchell .. | Dec. 16. | " J. L. Wood .. | Nov. 5. |

GIBRALTAR.

Lieutenant V. T. Carruthers .. Sept. 24.

MALTA.

| | | | |
|---|---|---|---|
| Lieut.-Col. A F. Russell, C.M.G. | Sept. 24. | Captain M. H. Babington .. | Sept. 24. |
| " H. L. E. White .. | Jan. 7. | Lieutenant W. K. Beaman .. | Jan. 7. |
| Captain A. E. Weld .. .. | " " | " H. G. Gibson .. | Nov. 5. |

STRAITS SETTLEMENTS.

| | | | |
|---|---|---|---|
| Lieut.-Col. H. E. Cree .. | Sept. 16. | Captain O. W. A. Elsner .. | Sept. 16. |

JAMAICA.

| | | | |
|---|---|---|---|
| Lieut.-Col. H. O. Trevor | Middle November. | Captain F. G. Richards | Middle November. |
| Major R. J. D. Hall .. | | " H. C. Sidgwick | |

MAURITIUS.

| | | | |
|---|---|---|---|
| Captain P. Mackessack .. | Oct. 31. | Lieutenant G. B. Edwards .. | Oct. 31. |

Lieutenant L. A. A. Andrews .. Feb. 25.

BERMUDA.

| | | | |
|---|---|---|---|
| Major H. C. Thurston, C.M.G. | Middle November. | Lieutenant J. A. B. Sim .. | Middle November. |
| Captain P. H. Faulkner | | | |

NORTH CHINA.

| | | | |
|---|---|---|---|
| Major A. C. Fox .. .. | Sept. 16. | Lieutenant J. C. Hart.. .. | Sept. 16. |
| Lieutenant E. J. Elliot .. | " " | | |

SOUTH CHINA.

| | | | |
|---|---|---|---|
| Major P. J. Probyn, D.S.O. .. | Sept. 16. | Lieutenant W. J. E. Bell .. | Sept. 16. |
| Captain A. E. Thorp .. .. | " " | " H. M. J. Perry .. | " " |

EGYPT.

| | | | |
|---|---|---|---|
| Lieut.-Col. H. Knaggs (Exchange) .. .. .. | Jan. 7. | Captain M. H. G. Fell.. .. | Jan. 7. |
| | | Lieutenant E. Gibbon .. .. | Sept. 17. |

CEYLON.

| | | | |
|---|---|---|---|
| Lieut.-Col. N. Manders .. | Sept. 16. | Major A. J. MacDougall .. | Sept. 16. |
| Major F. A. Symons .. .. | " " | | |

WEST AFRICA.

Major F. J. W. Porter, D.S.O. .. Jan.

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## EXAMINATIONS.

The following results of examinations are notified for general information :—

Passed in Military Law for the rank of Lieutenant-Colonel: Majors F. M. Mangin, O. L. Robinson, A. J. Chambers, H. W. Grattan, R. C. Lewis, J. F. M. Kelly, M.B.

Passed in Technical Subjects for the rank of Lieutenant-Colonel: Majors G. S. McLoughlin, D.S.O., M.B., and F. A. Symons, M.B.

Passed in : A.M.O., H. A. Bray; S. and E., E. E. Powell and H. A. Bray; *(d) iv* and S.S., E. E. Powell.

Passed in *(h) i* for the rank of Captain: W. S. Nealor; C. H. Denyer; A. G. Cummins, M.B.; and H. E. Crotelee.

Passed in *(h) ii* and *iii* for the rank of Captain: A. C. Amy, M.B.; A. H. Heslop, M.B. (80 per cent.); W. Mitchell, M.B. (80 per cent.); E. J. Elliot, M.B. (80 per cent.); D. Gibbon, M.B.; W. E. C. Lunn, M.B.; J. R. Foster; D. Coutts, M.B.;

J. A. Bennett, M.B. (80 per cent.); C. Kelly, M.B.; E. C. Phelan, M.B. (80 per cent.); and C. H. Denyer.

Passed in (*h*) *ii:* E. D. Caddell, M.B.; W. W. Boyce; J. J. O'Keeffe, M.B.

Passed in (*h*) *iii:* W. I. Thompson, M.B.

Passed in (*d*) *ii* for the rank of Captain: A. C. Amy, M.B.; A. H. Heslop, M.B. (75 per cent.); W. Mitchell, M.B.; E. J. Elliot, M.B. (75 per cent.); E. Gibbon, M.B.; E. B. Lathbury; E. D. Caddell, M.B.; B. Johnson; J. R. Foster; W. W. Boyce; D. Coutts, M.B.; F. L. Bradish; J. A. Bennett, M.B. (75 per cent.); W. J. E. Bell, M.B.; W. I. Thompson, M.B.; C. Kelly, M.B.; D. T. MacCarthy, M.B.; E. C. Phelan, M.B.; J. J. O'Keeffe, M.B.

## ROYAL ARMY MEDICAL COLLEGE.

### EXAMINATION OF LIEUTENANTS, ROYAL ARMY MEDICAL CORPS AND INDIAN MEDICAL SERVICE, AT THE CLOSE OF THE FIRST SESSION, 1908.

The following copies of Examination Papers are published for information:—

*Hygiene.*—(Written.) Thursday, June 25, 1908. From 2.30 p.m. to 5.30.

(1) You are placed in medical charge of a body of troops at a home station. State what you consider to be your duties in regard to their food supply. Give a short *résumé* of the regulations bearing on this point.

(2) Supposing there has been an excessive consumption of water in barracks, what is the proper course to pursue? What is the difference between a "constant" and an "intermittent" water supply, and what are the dangers attendant on the latter?

(3) Mention briefly the conditions of soil and climate that favour the development of malarial disease, and describe as fully as you can the preventive measures you would advise, with the reasons for each.

(4) Describe shortly the measures necessary for the sanitation of barracks occupied by British troops in a plains station in India, as regards removal of excreta and cook-house refuse.

(5) Explain the principles which govern the search for *Bacillus typhosus* in drinking-water supplies. Indicate the difficulties attendant on the isolation of the bacillus, and show how presumptive evidence of its presence, or absence, may be obtained by other methods of bacteriological procedure.

*Practical Hygiene.*—Friday, June 26, 1908. From 10 a.m. to 1 p.m.

(1) Complete the analysis of the sample of water before you, and fill in the following report:—

*Physical Characters*—

| | |
|---|---|
| Colour | Yellow |
| Sediment | Large |
| Smell | *Nil* |

*Chemical Characters*—

| | Parts per 100,000 |
|---|---|
| Total solids | 30 |
| Fixed solids | 10 |
| Chlorine. | |
| Oxygen absorbed 15 minutes at 80° F. | 0·150 |
| Free ammonia | 0·008 |
| Albuminoid ammonia | 0·009 |
| Nitrites as $NO_2$ | |
| Nitrates as N. | |
| Hardness total | 10·000 |
| Hardness fixed | 5·000 |
| Metals, qualitatively | |

Give an opinion as to the probable source of the water, and as to its fitness for drinking and domestic purposes.

State the results in parts per 100,000 and in grains per gallon.

(2) Estimate the amount of carbon dioxide in the air of the laboratory. State the results in volumes per 1,000.

*Pathology.*—(Written.) Tuesday, June 30, 1908. From 10 a.m. to 1. p.m.

(1) Describe in detail the manner in which you would carry out an estimation of the numbers and relative proportions of the leucocytes in the blood of a patient. What

fallacies may lead to an erroneous interpretation of such estimations, and how would you avoid them?

(2) What are the cultural and morphological characters of the *Diplococcus intracellularis meningitidis?* What is known as to the probable method of infection in the disease with which this micro-organism is associated?

(3) How would you distinguish the *Treponema pallidum* from other spirochetes? Discuss the evidence as to the causative *rôle* of this organism in syphilis.

(4) Draw up a table showing the principal morphological points by which the parasites of the three varieties of malaria, as encountered in the peripheral blood, may be differentiated one from the other.

*Practical Pathology.*—Thursday, June 25, 1908. From 10 a.m. to 1 p.m.

(1) Examine the bacterial culture marked with your number and write a short account of the characters of the germ or germs which you have found in it. Leave two stained specimens, one of which should be a "Gram," beside your microscope, marked as directed.

(2) Examine the unfixed blood film and record in your paper your opinion as to the nature of the case from which it was taken. Leave your specimen for examination.

(3) Mount and stain the paraffin section so as to show (*a*) the nature of the tissue, (*b*) the presence in it of Gram-negative bacilli.

(4) Oral examination as to specimens displayed under the microscope.

*Military Surgery.*—Friday, June 26, 1908. From 2.30 p.m. to 5.30 p.m.

(1) In what ways may gunshot wounds become infected? What circumstances increase the risk of infection, and what precautions must be taken to prevent infection occurring?

(2) Describe the forms of arterio-venous communications resulting from gunshot wounds Discuss their causation, symptoms, and treatment.

(3) Describe the several forms of gunshot injury of the spinal cord, and discuss their diagnosis, prognosis, and treatment.

(3) Give the symptoms, complications, and treatment of gunshot wounds of the lung.

(Twenty-five marks for each question).

*Tropical Medicine.*—Saturday, June 27, 1908. From 10 a.m. to 1 p.m.

(1) (*a*) How may the temperature of a healthy man vary in correspondence with external conditions? (*b*) What do you understand by the "critical point" in relation to temperature?

(2) What diseases of the tropics are most likely to render a patient (*a*) unfit for continued service in the country where he contracted the disease, and (*b*) for general service at home and abroad?

(3) Discuss the different forms of diarrhœa met with in the tropics in relation to their etiology.

(4) What are the characteristics of malarial cachexia, and how would you differentiate it from the diseases with which it may be confounded?

(5) Discuss the influence of the climatic factor in the spread of certain diseases of the tropics.

[N.B.—The first three questions, and either No. 4 or 5, to be answered, but not both.]

*Military Medical Administration.*—Monday, June 29, 1908. From 10 a.m. to 1 p.m.

(1) What is the "Army Council"? Mention the chief duties of the various members

(2) State briefly the position of the officer in charge of a military hospital with regard to the officer commanding the station and the administrative medical officer of the district.

(3) What is the procedure observed when a soldier reports sick?

(4) How is an invalid from abroad brought home? What are the arrangements for him on board ship? How is he disposed of on arrival?

(5) What are the principal points to remember when considering the question of invaliding a soldier?

## Examination of Captains for Promotion to Major.

The following copies of Examination Papers are published for information:—

*State Medicine.*—(Written.) Tuesday, June 30. From 2.30 to 5.30 p.m.

(1) Give, in outline, an account of the causation of plague, and a description, as

fully as you can, of the preventive measures you would take (*a*) when an outbreak is threatened; (*b*) when an outbreak has actually occurred.

(2) Contrast disinfection by dry air and by steam, explaining the principles on which the disinfection depends.

Describe fully any form of steam disinfector with which you are acquainted. Mention any special points which may occur to you in regard to disinfection in barracks, making reference to the regulations on the subject.

(3) Give an outline of your views as to the scope of your duties, if appointed as Specialist Sanitary Officer at a Home or Mediterranean station.

With your present knowledge and experience, what would you consider to be the most fruitful line or lines of work to pursue?

(4) Draw up a series of instructions, in the form of a draft order, for the purification of the drinking-water supply of a Field Force marching through a country where the water is obviously exposed to dangerous contamination. The force is supplied with a sufficiency of Service-pattern filters, and on the Sanitary Officer lies the responsibility that they are properly and efficiently used.

(5) It is now recognised that the gross dirt and the bacterial contents of milk are important factors in determining its fitness or otherwise for human consumption. Describe, in detail, the procedure you would employ with the view of establishing a standard of purity for your district, and of comparing your results with those of other Sanitary Officers.

*Practical State Medicine.*—First Day. Tuesday, June 30, 1908. From 10 a.m. to 1 p.m.

(1) Examine the sample of butter before you and report on its fitness or otherwise for issue to patients in hospital.

(A portion has been separated for the determination of butter fat.)

(2) Examine and report on the sample of milk before you, as to its fitness for use in hospital, giving your reasons for the statements made.

N.B.—Preservatives are not present in either case.

*Practical State Medicine.*—Second Day. Wednesday, July 1, 1908. From 10 a.m to 1 p.m.

Examine and report on the sample of water supplied you.

(Typical *B. coli communis* of Escherich has been found to be present in 2 cc. The source of the water is a spring on an open moor, over which sheep graze.)

*Bacteriology.*—(Written.) Tuesday, June 30, 1908. From 2.30 p.m. to 5.30 p.m.

(1) Describe in detail the method in general use for carrying out the prophylactic treatment of rabies. How would you determine whether a suspected animal was suffering from this disease?

(2) Describe the distribution of the typhoid bacillus in the body of a patient dead of typhoid fever. How would you isolate the organism, and how would you differentiate it from other organisms which might be present? Discuss the reasons for believing in the efficacy of vaccination as a prophylactic against the disease.

(3) Discuss the modern theories which are held as to the etiology of yellow fever, and as to the part played by mosquitoes in its spread.

(4) Describe the differences found in the blood in the different varieties of malaria. Discuss the question of the possible existence or development of immunity against this disease.

*Bacteriology.*—Practical. First Day. Tuesday, June 30, 1908. From 10 a.m. to 1 p.m.

(1) Examine the pathological secretion, marked "A," with a view to determining the presence of pathogenic micro-organisms:—

(*a*) Record the results of your direct examination in your paper and leave your stained films, marked with your examination number, beside your microscope.

(*b*) Endeavour to isolate in pure culture whatever germ you suspect to have been the cause of the pathological process, and set your cultures aside for incubation.

(2) Mount the paraffin block, marked "B," on the microtome, and cut sections, which you will then stain so as to demonstrate the chromatin of the protozoal organisms contained in the tissue. Label your specimen and describe in your paper the results of your examination, mentioning the nature of the tissue and any variations from the normal histological characters which you may have noted.

(3) Examine the two stained films marked with your number, and write a short account of what you have found.

*Bacteriology.*—(Practical.) Second Day. Wednesday, July 1, 1908. From 10 a.m. to 1 p.m.

(1) Complete the examination of the cultures which you prepared yesterday and record the results in your paper. In the case of any of the germs which you have isolated appearing to you pathogenic, mention the further tests to which you would submit them with a view to their final identification.

Leave your cultures and stained specimens for inspection.

(2) Determine the "end-point" of agglutination to *B. typhosus* of the sample of blood serum, employing the hanging-drop method and taking a time-limit of half-an-hour. Describe your technique and the result.

(3) Oral examination.

*Midwifery and Gynæcology.* (Written.)—Monday, June 29, 1908. From 10 a.m. to 1 p.m.

(1) Describe the treatment of a case of shoulder presentation (*a*) when the membranes are unruptured and the os is of the size of a shilling, (*b*) when the membranes are ruptured and the os is of the size of a florin, and (*c*) with the membranes ruptured and the os fully dilated.

(2) What are the causes of hæmorrhage during the first half of pregnancy? Discuss the diagnosis and treatment.

(3) Mention the causes, and discuss the diagnosis and treatment, of hæmorrhage occurring after the menopause.

(4) Give the diagnosis and treatment of eclampsia.

(5) What are the indications for the operation of Cæsarian section? Describe in detail the steps of the operation.

(6) Mention the complications which may occur in the case of an ovarian cyst of the size of a cocoa-nut, and give the symptoms indicative of each.

*Ophthalmology.*—(Written.) Monday, June 29, 1908. From 2 p.m. to 5 p.m.

(1) Describe the symptoms, course, complications, pathology, and treatment, both prophylactic and therapeutic, of trachoma.

(2) What are the causes, proximate and remote effects, operative or other treatment, of cicatricial ectropion of the lower lid?

(3) Give an account of interstitial keratitis, its symptoms, course, complications, etiology, and treatment.

(4) Describe the abnormalities of size, shape, position, and motility of the pupils, and their indications in disease.

*Otology, including Laryngology and Rhinology.*—(Written.) Monday, June 29, 1908. From 10 a.m. to 1 p.m.

(1) Describe the "Weber" and "Rinne" tests, and state the indications which they afford.

(2) Mention the commoner affections of the external auditory meatus, and describe the treatment you would adopt for each.

(3) Describe briefly the pathological anatomy of the condition known as "quinsy," and give the treatment.

(4) What is meant by the following terms: Paracusis Willisii, cacosmia, Semon's law, recurrent paralysis, Menière's symptoms?

(5) Give the symptoms of ozæna, and the treatment you would adopt.

(6) Give the symptoms and diagnosis of malignant disease of the nose and naso-pharynx.

(7) Describe the symptoms and laryngoscopic appearances in functional aphonia.

(8) Enumerate the causes of tracheal (not laryngeal) stenosis.

### EXAMINATIONS.

The following questions set for the May, 1908, Examination of Candidates for Army Form C. 344, Certificate of Training as a Nurse, are published for the information of prospective candidates:—

*Anatomy.*—(Time allowed, one-and-a-half hours.)

(1) Describe the diaphragm, mentioning the principal structures that pierce it, and the chief organs which lie above and below it respectively.

(2) What is the spleen, where is it to be found, and what are its functions?

(3) What bones are concerned in forming the following joints: (i.) The head on the spine? (ii.) The elbow? (iii.) The hip? (iv.) The ankle?

State what movements can be carried out in each case.

*Physiology.*—(Time allowed, one-and-a-half hours.)

(1) Name, in order, the several parts of the alimentary canal. Why is it so called?

(2) How many different kinds of sensations are there? What conditions are necessary in order that the brain may perceive a sensation?

(3) Describe, with the aid of appropriate drawings, if possible, the form and general structure of the corpuscles of the blood. What is their chief function?

*Sick Room Cookery.*—(Time allowed, one-and-a-half hours.)

(1) How would you prepare raw meat juice? Give the exact quantities of meat to water. How long will this preparation keep?

(2) What effect has peptonisation upon food?

In what cases of illness are peptonised foods most valuable?

Describe how you would peptonise one pint of milk.

(3) How would you prepare: (*a*) Egg flip? (*b*) Lemonade?

*Surgical Nursing.*— (Time allowed, two hours.)

(1) State and explain the terms commonly used in the classification of wounds.

Describe briefly the natural processes by which the healing of wounds is effected.

(2) Describe how you would prepare a patient for an abdominal operation (not emergency).

The chief points in the after nursing of such a case.

(3) Describe how you would render first aid to a case of compound fracture of the tibia and fibula (not in hospital).

Give an account of your duties when in charge of this case after the medical officer has done his work.

*Medical Nursing.*—(Time allowed, two hours.)

(1) Give some account of bed sores as to: (*a*) how they are caused; (*b*) how they may be prevented; (*c*) how they should be treated when already existing, according to their various stages and degrees.

(2) Give some account of enteric fever: (*a*) the usual symptoms and course; (*b*) the most common complications; (*c*) the chief points with regard to the nursing.

(3) How would you render first aid in cases of poisoning by: (*a*) Carbolic acid? (*b*) Chloral? (*c*) Arsenic?

What are the chief symptoms of poisoning in these three cases?

*Ward Management.*—(Time allowed, one-and-a-half hours.)

(1) Supposing no steam disinfectors are available, give in detail the precautions you would take when nursing enteric fever in a hospital in the field with regard to: (*a*) disinfection of linen; (*b*) disinfection and disposal of excreta.

(2) Give a short outline of the reasons why ventilation is necessary, and of the methods by which it may be secured.

(3) What are your duties regarding the personal cleanliness of the patients, both helpless and convalescent?

How would you carry out these duties?

*Duties of Operating Room Attendant.*—(Time allowed, two hours.)

(1) A man is admitted to hospital with acute appendicitis. An immediate operation (emergency) is necessary. How would you prepare the patient, and what instruments, &c., would be required in the theatre?

(2) Name the various local and general anæsthetics you have seen employed. Describe shortly the different apparatus used in the latter, and state how you would ensure asepsis in their daily use.

(3) A knee joint has been opened, blood poisoning follows; enumerate the various possible sources of infection, stating how they severally might have been avoided.

(4) Collapse occurs during an operation for empyæma. Having anticipated its possibility, what remedies have you at hand?

*Note.*—3 and 4 are alternative questions, only one to be answered.

# SCHOOLS OF ARMY SANITATION.

The following extracts from the Military Orders of the Commonwealth Forces, dated June 9, 1908, are published for general information :—

"(1) Schools of Army Sanitation will be established at the Headquarters of each District, and classes formed for instruction.

"(2) District Commandants will arrange for at least one annual course of lectures in sanitation. The instruction will be given at District Headquarters by the 'Command Sanitary Officer,' or by a specially selected officer from the Australian Army Medical Corps. The course will consist of twelve lectures.

"(3) 'The Manual of Sanitation in its Application to Military Life,' issued with Army Orders, February 1, 1907, will be the text-book, and instruction and examinations will be based upon this manual.

"(4) After December 31, 1908, all Lieutenants in the Military Forces of the Commonwealth will be required to pass an examination in sanitation before promotion to the rank of Captain. Examinations will be held at the termination of each course, or half-yearly, if required. Fifty per cent. of marks must be obtained to pass the 'Standard of Qualification.' A Lieutenant may be examined without having attended a course of lectures.

"(5) Classes will also be formed as follows :—

"(*a*) Officers' classes of not more than twenty-five officers, open to all officers of the Commonwealth Military Forces.

"The course will consist of twelve lectures, and an examination will be held at its termination. Officers (others than of the rank of Lieutenant, who are required to pass the Standard of Qualification) who gain 50 per cent of the marks will be recorded as 'Passed,' and those who gain 75 per cent. will be recorded as 'Distinguished.'

"The lectures will embrace the whole of the subjects included in "The Manual of Sanitation" previously alluded to.

"(*b*) Classes for regimental non-commissioned officers and men to form regimental sanitary sections for instruction in the disposal of excreta and refuse, in camp cleanliness, and in sanitary police duties, to fit them to perform these duties on active service One non-commissioned officer and eight men per regiment, battalion, or rigade of artillery, will be trained. A class will not exceed forty-five non-commissioned officers and men. This course will consist of six lectures.

"(*c*) Classes consisting of not more than twenty-five non-commissioned officers and men of the Australian Army Medical Corps, to be instructed in practical sanitation in the field, and in duties of water sterilisation. This course will consist of ten lectures.

"Examinations will be held at the termination of classes (*b*) and (*c*), and certificates of 'proficiency' given to those who qualify.

"(6) Officers of squadrons, batteries, and companies, after having passed the 'Standard of Qualification,' or 'Passed,' will give instruction in sanitation to the non-commissioned officers and men under their command."

# INTERNATIONAL CONGRESS FOR HYGIENE AND DEMOGRAPHY.

(BERLIN, SEPTEMBER 23-29, 1907.)

THE following note has been received from the General Secretary :—

"The publication of the official report of the Congress being finished, the works of the Fourteenth International Congress for Hygiene and Demography are now completed. The last two volumes will be despatched to the members of the Congress during the present month (June). The price of the complete report is 50 marks. The volumes can also be obtained separately at the following prices: Vol. I., 6 marks; Vol. II., 14 marks; Vol. III., Part 1, 10 marks, Part 2, 10 marks; Vol. IV., 10 marks."

# THE RETIREMENT OF MR. GILLHAM.

THE following additional subscription has been received:—

| | £ | s. | d. |
|---|---|---|---|
| Balance (June 16, 1908) .. .. .. .. .. .. | 10 | 19 | 0 |
| Captain P. H. Henderson .. .. .. .. .. | 0 | 10 | 0 |
| Received to date, July 15, 1908 .. .. .. .. | £11 | 9 | 0 |

Subscriptions to the "Gillham Fund," the objects of which are explained in the CORPS NEWS for March, 1908, p. 83, may be sent to Captain C. F. Wanhill, R.A.M.C., Royal Army Medical College, Millbank, London, S.W., and will be acknowledged in this publication.

# ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

MINUTES of a Committee Meeting held at the War Office, at 2.30 p.m., Friday, July 17, 1908.

*Present.*

Surgeon-General Sir Charles Cuffe, K.C.B., Vice-President, in the Chair.

Colonel T. Ligertwood, C.B.; Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O.; Lieutenant-Colonel W. G. Macpherson, C.M.G.; Lieutenant-Colonel R. H. Firth; Lieutenant-Colonel J. Martin.

(1) The minutes of the last Meeting were read and confirmed.

(2) An application for a grant from Miss L. E. S., orphan daughter of B.S., was considered, and it was decided to make her a grant of £15 as a special case.

(3) It was resolved to accept the following report of the Sub-Committee appointed to examine the application forms of the Society:—

"The Sub-Committee, having carefully perused the 'forms of application,' is of opinion that, with the exception of one or two minor alterations in the wording, no changes are required, and considers that the forms in their present state are best suited for the purpose for which they are intended, and suggests that rules 1, 2, 3, 4 should be printed on the backs of the forms."

In order to ensure that the full circumstances of the general conditions under which the applicants are living be known, the Sub-Committee recommends that all cases be personally visited by the Secretary, or other responsible member of the Society, once in every three years; unless an applicant lives in, or in the vicinity of, a garrison town—in which case it is recommended that the Principal Medical Officer be asked to detail an officer of the Royal Army Medical Corps to report upon the circumstances of the applicant. The Sub-Committee further recommends that the expenses of such visits be borne by the Society, and a report made to the next General Meeting."

A vote of thanks to the Chairman ended the Meeting.

## ROYAL ARMY MEDICAL CORPS FUND.

### ACCOUNTS FOR THE HALF-YEAR ENDING JUNE 30, 1908.

| RECEIPTS. | | £ | s. | d. |
|---|---|---|---|---|
| In hand on January 1, 1908— | | | | |
| Current Account | £329 18 7 | | | |
| On Deposit | 900 0 0 | | | |
| | | 1,229 | 18 | 7 |
| Subscriptions | | 1,035 | 13 | 6 |
| Interest on Deposits | | 9 | 5 | 0 |
| | | £2,274 | 17 | 1 |

| EXPENDITURE. | | £ | s. | d. |
|---|---|---|---|---|
| Portrait of Guthrie | | 52 | 10 | 0 |
| Tulloch Memorial | | 100 | 0 | 0 |
| V.C. Painting—Captain Douglas | | 15 | 0 | 0 |
| Framing Pictures, &c. | | 6 | 11 | 6 |
| Band | | 247 | 0 | 0 |
| Dinner | | 254 | 3 | 6 |
| Secretary's Salary | | 18 | 15 | 0 |
| Clerical Assistance | | 13 | 0 | 0 |
| Shorthand Writers | | 1 | 10 | 0 |
| Printing | | 1 | 11 | 7 |
| Stationery | | 2 | 7 | 6 |
| Postage | | 1 | 6 | 3 |
| Grant to General Relief Fund | | 10 | 10 | 0 |
| Bankers' Charges | | 0 | 8 | 7 |
| Balance in hand— | | | | |
| Current Account | £650 3 2 | | | |
| On Deposit | 900 0 0 | | | |
| | | 1,550 | 3 | 2 |
| | | £2,274 | 17 | 1 |

## GENERAL RELIEF FUND.

| RECEIPTS. | | £ | s. | d. |
|---|---|---|---|---|
| In hand on January 1, 1908— | | | | |
| Current Account .. .. .. .. | £230 18 3 | | | |
| On Deposit .. .. .. .. .. | 1,100 0 0 | | | |
| | | 1,330 | 18 | 3 |
| Interest on Deposit .. .. .. .. .. | | 13 | 3 | 10 |
| Grants from R.A.M.C. Fund .. .. .. .. | | 10 | 10 | 0 |
| Aldershot .. .. .. .. .. .. .. | | 55 | 0 | 0 |
| Aldershot, Army Temperance Association .. .. | | 5 | 5 | 0 |
| No. 6 Company, Portsmouth .. .. .. .. | | 5 | 0 | 0 |
| No. 7 ,, Devonport .. .. .. .. | | 3 | 0 | 0 |
| No. 9 ,, Colchester .. .. .. .. | | 2 | 10 | 0 |
| No. 10 ,, Chatham .. .. .. .. | | 3 | 0 | 0 |
| No. 12 ,, Woolwich .. .. .. .. | | 7 | 10 | 0 |
| No. 14 ,, Dublin .. .. .. .. | | 5 | 0 | 0 |
| No. 18 ,, London .. .. .. .. | | 6 | 10 | 0 |
| No. 19 ,, Chester .. .. .. .. | | 4 | 6 | 0 |
| No. 23 ,, Pretoria .. .. .. .. | | 30 | 0 | 0 |
| No. 24 ,, Bloemfontein .. .. .. | | 19 | 18 | 0 |
| No. 31 ,, Mauritius .. .. .. .. | | 3 | 0 | 0 |
| Detachment, Middelburg .. .. .. .. | | 6 | 1 | 0 |
| ,, Tipperary .. .. .. .. | | 1 | 1 | 0 |
| ,, Harrismith .. .. .. .. | | 20 | 0 | 0 |
| ,, Standerton .. .. .. .. | | 20 | 0 | 0 |
| ,, Potchefstroom .. .. .. .. | | 6 | 0 | 0 |
| Donations from Officers .. .. .. .. | | 6 | 11 | 0 |
| Field Ambulance, Curragh .. .. .. .. | | 7 | 1 | 9 |
| Rebate of Stamp Duty .. .. .. .. | | 2 | 12 | 6 |
| | | £1,573 | 18 | 4 |

| EXPENDITURE. | | £ | s. | d. |
|---|---|---|---|---|
| Purchase of £606 Canada 3½ % Stock, 1930-1950, at £100 .. .. .. | £608 6 9 | | | |
| Commission and Stamp .. .. .. | 1 11 3 | | | |
| | | 609 | 18 | 0 |
| Purchase of £500 E. India Railway 3½ % Debenture Stock at £97 .. .. | 485 0 0 | | | |
| Commission and Stamp .. .. .. | 5 2 0 | | | |
| | | 490 | 2 | 0 |
| Subscriptions (Union Jack Club) .. .. .. | | 25 | 4 | 0 |
| Corps of Commissionaires .. .. .. .. | | 10 | 0 | 0 |
| National Association for Employment .. .. .. | | 5 | 0 | 0 |
| Soldiers' and Sailors' Help Association .. .. .. | | 5 | 5 | 0 |
| Drummond Institute .. .. .. .. .. | | 5 | 0 | 0 |
| Bank Charges .. .. .. .. .. .. | | 0 | 7 | 9 |
| P M.O., London .. .. .. .. .. | | 40 | 7 | 6 |
| ,, Dublin .. .. .. .. .. | | 22 | 0 | 0 |
| ,, Aldershot .. .. .. .. .. | | 8 | 12 | 0 |
| ,, Dover .. .. .. .. .. | | 3 | 10 | 0 |
| ,, Cork .. .. .. .. .. | | 4 | 0 | 0 |
| ,, Netley .. .. .. .. .. | | 6 | 0 | 0 |
| ,, Chester .. .. .. .. .. | | 1 | 0 | 0 |
| ,, York .. .. .. .. .. | | 2 | 0 | 0 |
| ,, Belfast .. .. .. .. .. | | 2 | 0 | 0 |
| ,, Colchester .. .. .. .. .. | | 1 | 0 | 0 |
| ,, Devonport .. .. .. .. .. | | 6 | 0 | 0 |
| ,, Woolwich .. .. .. .. .. | | 2 | 0 | 0 |
| ,, Portsmouth .. .. .. .. .. | | 8 | 0 | 0 |
| Balance .. .. .. .. .. .. .. | | 316 | 12 | 1 |
| | | £1,573 | 18 | 4 |

## CHARITABLE SCHOOL FUND.

| RECEIPTS. |  | £ s. d. | EXPENDITURE. |  | £ s. d. |
|---|---|---|---|---|---|
| Balance in hand on January 1, 1908— |  |  | Northants Orphanage, for 1 Girl .. .. .. |  | 8 0 0 |
| Current Account .. .. .. | £76 8 0 |  | Royal Soldiers' Daughters' Home—3 Girls .. .. |  | 28 10 0 |
| On Deposit . .. .. .. | 1,000 0 0 |  | St. Vincent de Paul's Male Orphanage, for 1 Boy .. |  | 8 10 0 |
|  |  | 1,076 8 0 | Gordon Boys' Orphanage, for 1 Boy .. .. .. |  | 8 0 0 |
| Interest on Deposit Account .. .. .. .. |  | 12 10 0 | St. Francis' Home, for 1 Boy .. .. .. .. |  | 15 0 0 |
|  |  |  | Balance—Current Account .. .. | £20 18 0 |  |
|  |  |  | Deposit Account .. .. | 1,000 0 0 |  |
|  |  |  |  |  | 1,020 18 0 |
|  |  | £1,088 18 0 |  |  | £1,088 18 0 |

## BALANCE SHEET.

| LIABILITIES. | £ s. d. | ASSETS. |  | £ s. d. |
|---|---|---|---|---|
| To R.A.M.C. Fund .. .. .. .. .. | 1,550 3 2 | By Cash at Bankers, January 1, 1908.. | £648 14 10 |  |
| ,, General Relief Fund.. .. .. .. .. | 1,409 18 10 | ,, Total Receipts.. .. .. .. | 2,427 12 4 |  |
| ,, Compassionate School Fund .. .. .. | 1,020 18 10 |  |  | 3,076 7 2 |
|  |  | ,, ,, Expenditure .. .. .. .. .. |  | 2,079 3 1 |
|  |  | Balance at Bank, June 30, 1908 .. .. |  | 997 4 1 |
|  |  | *Less* Outstanding Cheque .. .. .. |  | 9 10 0 |
|  |  |  |  | 987 14 1 |
|  |  | ,, Deposits— |  |  |
|  |  | R.A.M.C. Fund .. .. .. .. .. |  | 900 0 0 |
|  |  | School Fund .. .. .. .. .. |  | 1,000 0 0 |
|  |  | ,, Investment—General Relief Fund .. .. |  | 1,093 6 9 |
|  | £3,981 0 0 |  |  | £3,981 0 10 |

Examined and found correct.

*July* 7, 1908.

(*Signed*) D. WARDROP, *Colonel.*

## ROYAL ARMY MEDICAL CORPS BAND FUND.

### BALANCE SHEET FOR QUARTER ENDING JUNE 30, 1908.

#### RECEIPTS.

| Date. 1908. | | £ | s. | d. |
|---|---|---|---|---|
| April 1. | Balance credit .. .. .. .. .. | 4 | 1 | 4 |
| ,, 14. | Subscriptions, Officers' Mess, Aldershot, March | 9 | 10 | 0 |
| ,, 15. | Quarterly grant from Corps Fund .. .. | 100 | 0 | 0 |
| May 15. | Subscriptions, Officers' Mess, Aldershot, April | 9 | 5 | 0 |
| June 16. | Subscriptions, Officers' Mess, Aldershot, May | 5 | 7 | 6 |
| May 5. | 2 Officers' Subscriptions .. .. .. | 0 | 10 | 0 |
| ,, 6. | Captains' Class, Millbank .. .. .. | 13 | 10 | 0 |
| | | £142 | 3 | 10 |

#### EXPENDITURE.

| Date. 1908. | | £ | s. | d. |
|---|---|---|---|---|
| May 1. | Bandmaster's Salary, April .. .. .. | 10 | 0 | 0 |
| ,, ,, | Bandsmen's Pay .. .. .. .. | 11 | 15 | 0 |
| ,, 21. | Expenses, Band playing Corton Hall .. | 5 | 13 | 6 |
| ,, 29. | Bandmaster's Salary, May .. .. .. | 10 | 0 | 0 |
| ,, ,, | Bandsmen's Pay .. .. .. .. | 12 | 4 | 6 |
| June 26. | Bandmaster's Salary, June .. .. .. | 10 | 0 | 0 |
| ,, ,, | Bandsmen's Pay, June .. .. .. | 12 | 0 | 0 |
| ,, ,, | Postage .. .. .. .. .. .. | 0 | 5 | 3 |
| ,, ,, | Painting Band Stands.. .. .. .. | 0 | 2 | 0 |
| ,, ,, | Chappell & Co. (Music String Band) .. | 0 | 7 | 9 |
| ,, ,, | A. W. Hillman (Marches Military Band) .. | 0 | 10 | 11 |
| ,, ,, | Cheque Book .. .. .. .. .. | 0 | 4 | 2 |
| June 30. | Gale and Polden (Printing, &c.) .. .. | 1 | 10 | 0 |
| ,, ,, | Boosey and Co. (Instruments, Music and Repairs) .. .. .. .. .. | 31 | 6 | 4 |
| ,, ,, | Kosokes (Music and Repairs).. .. .. | 7 | 17 | 7 |
| ,, ,, | Advanced to Band for Expenses and Fees, June 9, 1908, and June 23, 1908 (due from Millbank College) .. .. .. .. | 10 | 4 | 10 |
| ,, ,, | Credit Balance .. . .. .. .. | 18 | 0 | 2 |
| | | £142 | 3 | 10 |

*Aldershot,*
*July* 1, 1908.

(*Signed*) H. G. F. STALLARD, *Captain, R.A.M.C.,*
*Band President.*

## STATEMENT OF ACCOUNTS OF THE JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

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### TRADING ACCOUNTS FROM JULY 1, 1907, TO JUNE 30, 1908.

**EXPENDITURE.**

| | | £ s. d. |
|---|---|---|
| To Publishers' Bills— | | |
| Journal .. .. .. .. | £907 14 6 | |
| Corps News .. .. .. .. | 182 14 4 | |
| Distribution List .. .. .. | 23 14 0 | |
| Seniority Roll .. .. .. | 22 10 0 | |
| Reprints .. .. .. .. | 27 15 8 | |
| Stationery, Postages, &c. .. .. | 49 0 6 | |
| Sundries .. .. .. .. | 11 5 7 | |
| | | 1,224 14 7 |
| ,, Contingent Acconnt .. .. .. .. .. | | 39 5 0 |
| ,, Honorarium to Editor.. .. .. .. .. | | 100 0 0 |
| ,, Honorarium to Clerk in Record Office .. .. | | 5 15 0 |
| ,, The Linnean Society .. .. .. .. .. | | 0 3 6 |
| ,, Mr. Engel Terzi .. .. .. .. .. | | 3 3 0 |
| ,, Messrs. Josephs .. .. .. .. .. | | 6 15 0 |
| ,, Messrs. Straker .. .. .. .. .. | | 0 19 7 |
| ,, Exchange on Drafts .. .. .. .. .. | | 0 3 6 |
| ,, Cheque Book .. .. .. .. .. .. | | 0 4 2 |
| ,, Bank Postages .. .. .. .. .. .. | | 0 3 0 |
| Total Working expenses .. .. | | 1,381 6 4 |
| Balance on year's working to Balance Sheet .. | | 271 4 1 |
| | | £1,652 10 5 |

**INCOME.**

| | | £ s. d. |
|---|---|---|
| By Subscriptions to Journal received in 1907-08 .. .. .. .. | £1,145 6 11 | |
| ,, Subscriptions credited in error and refunded .. .. .. .. | 5 10 0 | |
| | | 1,139 16 11 |
| ,, Subscriptions to Corps News received in 1907-08 .. .. .. .. .. .. | | 39 11 4 |
| ,, Subscriptions to Seniority Roll received in 1907-08 .. .. .. .. .. | | 30 2 1 |
| ,, Advertisements in Journal .. .. .. .. | | 215 6 3 |
| ,, ,, in Seniority Roll .. .. .. | | 1 2 6 |
| ,, Sales through Manager .. .. .. .. | | 7 7 2 |
| ,, ,, ,, Publishers .. .. .. .. | | 150 4 11 |
| ,, Receipts for reprints .. .. .. .. .. | | 17 15 1 |
| ,, ,, Binding .. .. .. .. .. | | 0 19 2 |
| ,, Interest on War Loan Bonds .. .. .. | | 18 5 8 |
| ,, ,, Indian Stock .. .. .. .. | | 17 9 0 |
| ,, ,, Deposit .. .. .. .. .. | | 14 10 4 |
| | | £1,652 10 5 |

## BALANCE SHEET.

| LIABILITIES. | £ s. d. |
|---|---|
| Publishers' Bill for Quarter ending June 30, 1908 | 355 3 11 |
| Balance Credit | 1,473 15 9 |
| | £1,828 19 8 |

| ASSETS. | | | | | £ s. d. |
|---|---|---|---|---|---|
| Balance at Bank on July 1, 1907— | | | | | |
| Current Account | | | | £40 6 11 | |
| Deposit ,, | | | | 700 0 0 | |
| Balance Profit on Year's Working | | | | 271 4 1 | |
| National War Loan Bonds | | | | 694 16 0 | |
| This Balance is held as follows— | | | | | 1,706 7 0 |
| National War Loan Bonds | | | £694 16 0 | | |
| August 30, 1907. Purchase £700 India Stock | | | 684 6 0 | | |
| July 1, 1907. Deposit Account | £700 0 0 | | | | |
| July 31, 1907. Placed on Deposit | 600 0 0 | £1,300 0 0 | | | |
| August 21, 1907. Withdrawn from Deposit | 700 0 0 | | | | |
| Dec. 4, 1907, ditto | 100 0 0 | | | | |
| Feb. 25, 1908, ditto | 200 0 0 | 1,000 0 0 | | | |
| | | | 300 0 0 | | |
| Current Account at Bank, July 1, 1908 | | | 27 5 0 | | |
| | | | £1,706 7 0 | | |
| Credit Business Manager's Contingent Account (Stamps) | | | | | 1 3 1 |
| Furniture, &c. | | | £39 7 3 | | |
| ,, Purchased during Year | | | 15 4 8 | | |
| | | | | £54 11 11 | |
| *Less* 10 per cent. wear and tear | | | | 5 9 2 | |
| | | | | | 49 2 9 |
| Subscriptions not Paid on July 1, 1908 | | | | | 14 0 0 |
| Reprints not Paid on July 1, 1908 | | | | | 3 10 7 |
| Part Cost of Production of Plate, July 1, 1908 | | | | | 7 10 0 |
| Advertisements for Quarter ending June 30, 1908 | | | | | 47 6 3 |
| | | | | | £1,828 19 8 |

*July* 8, 1908.
(*Signed*) H. J. M. BUIST, *Major, R.A.M.C.*
*Hon. Manager, Journal of the R.A.M.C.*

Examined and found correct,
D. WARDROP, *Colonel.*
A. M. DAVIES, *Lieutenant-Colonel.*

# ROYAL ARMY MEDICAL CORPS FUND.

PROCEEDINGS OF A COMMITTEE MEETING HELD AT THE WAR OFFICE AT 3.30 P.M. ON FRIDAY, JULY 17, 1908.

*Present.*

Surgeon-General W. L. Gubbins, C.B., M.V.O., Vice-Chairman, in the Chair.
Surgeon-General Sir Charles Cuffe, K.C.B.
Colonel D. Wardrop.
Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O.
Lieutenant-Colonel A. B. Cottell.
Major H. C. Thurston, C.M.G.
Captain Bruce.

(1) The Minutes of the last Meeting were read and confirmed.

(2) It was noted that £50 had been paid for the Guthrie painting, and £254 3s. 6d. towards the Annual Dinner.

(3) *General Relief.*—It was noted that the following sums had been received during the quarter ending June 30, 1908, for the General Relief Fund:—

| | £ | s. | d. |
|---|---|---|---|
| Royal Army Medical Corps Fund | 10 | 10 | 0 |
| Companies Aldershot | 50 | 0 | 0 |
| No. 2 Company, Aldershot | 5 | 0 | 0 |
| ,, 6 ,, Portsmouth | 5 | 0 | 0 |
| ,, 12 ,, Woolwich | 2 | 10 | 0 |
| ,, 14 ,, Dublin | 5 | 0 | 0 |
| ,, 23 ,, Pretoria | 30 | 0 | 0 |
| ,, 31 ,, Mauritius | 3 | 0 | 0 |
| Detachment Standerton | 20 | 0 | 0 |
| Potchefstroom | 6 | 0 | 0 |
| Curragh Field Ambulance | 7 | 1 | 9 |
| Army Temperance Association, Aldershot | 5 | 5 | 0 |
| Total | £149 | 6 | 9 |

(4) The grants made from the General Relief Fund for the quarter ending June 30 were confirmed, and a list of the recipients is attached to the Minutes.

(5) The case of the widow of the late Serjeant-Major M. was brought before the Committee. As she has five grown-up children making her allowance, it was resolved that no grant be given her.

(6) With reference to Minute 5c of the Committee Meeting, held on October 17 last, wherein it was decided that the Secretary should not give a sum exceeding £2 a quarter to any case, it was resolved that the Secretary should not give a sum exceeding £4 to any case in any half-year. This brings the rules in accordance with the general relief forms now in use, which are good for six months only.

(7) The half-yearly accounts, which have been duly audited, were considered and passed, and are appended to the Minutes.

(8) *Band.*—The Band accounts were considered and passed, and are attached to these Minutes, and a sum of £170 voted for the current quarter's expenses. This sum includes the grant of £130 passed at the last Committee Meeting for providing a band practice room at Aldershot.

(9) It was resolved that the subscription to the Soldiers' and Sailors' Help Association should be in future £5, instead of £5 5s.

(10) A sum of £5 was voted for the Royal Army Medical Corps Fund to the South African Graves Fund.

(11) A letter of thanks was read from Mrs. Tulloch for the silver replica of the Tulloch Memorial Medal.

(12) It was resolved to postpone the election of an Auditor, *vice* Surgeon-General A. T. Sloggett, C.M.G.

F. W. H. DAVIE HARRIS, *Lieutenant-Colonel, Secretary.*

*July* 17, 1908.

## ROYAL ARMY MEDICAL CORPS BAND FUND.—*Estimate.*

| RECEIPTS. | £ | s. | d. |
|---|---|---|---|
| (1) Balance Credit | 18 | 0 | 2 |
| (2) Outstanding Credit | 10 | 4 | 10 |
| (3) Officers' Subscriptions | 15 | 0 | 0 |
| | £43 | 5 | 0 |

| EXPENDITURE. | £ | s. | d. |
|---|---|---|---|
| (1) Bandmaster's Salary, at £10 | 30 | 0 | 0 |
| (2) Bandsmen's Pay, at £12 15s. | 38 | 5 | 0 |
| (3) Music and Repairs | 15 | 0 | 0 |
| (4) Grant for Band Practice Hut | 130 | 0 | 0 |
| | 213 | 5 | 0 |
| Deduct Receipts | 43 | 5 | 0 |
| | £170 | 0 | 0 |

The above sum, £170, should be sufficient for the next quarter.

(*Signed*) H. G. F. STALLARD, *Captain, R.A.M.C.*
*Aldershot, July* 4, 1908. *Band President.*

### RECIPIENTS FROM THE GENERAL RELIEF FUND FOR THE QUARTER ENDING JUNE 30, 1908.

| Name | Age | District | Grant | Total | Remarks |
|---|---|---|---|---|---|
| Mrs. N. S. | 65 | London | £2 | £36 10s. | Destitute; earns 1s. weekly. |
| Mrs. A. S. | 39 | ,, | £2 | £112 | Unable to get continuous work; two children, aged 9 and 10, to support. Last grant. |
| Mrs. E. W. | 32 | ,, | £1 16s. | £10 18s. | Out of work; supports a child aged 5. Last grant. |
| Mrs. E. B. | 79 | ,, | £2 | £24 10s. | Now deceased. |
| Mr. H. N. | 43 | ,, | £2 | £50 | Nearly blind; earns 1s. 9d. a week; supports a child aged 10. |
| Mrs. A. G. | 41 | ,, | £2 | £42 | Poverty and ill-health; three children to support, ages 10, 8, and 3. |
| Mrs. M. W. | 35 | ,, | £2 | £4 | Ill-health, unable to work; three children, ages 6½, 5½, and 1½. |
| Mrs. E. P. | 41 | ,, | £2 | £2 | Delicate health; suffers from chronic bronchitis; three children, ages 13, 12, and 5½. |
| Mrs. M. I. | 63 | Dublin | £2 | £74 | Decrepit; unable to work. |
| Mrs. E. A. G. | 51 | ,, | £1 10s. | £55 10s. | Unable to work owing to ill-health; child aged 14 to support. Last grant. |
| Mrs. E. R. | 47 | ,, | £1 10s. | £108 | Poverty and bad health. Last grant. |
| Mrs. M. S. | 70 | ,, | £2 | £86 | Decrepit and blind; quite unable to work. |
| Mrs. A. B. | 40 | ,, | £1 10s. | £14 | Poverty; unable to get work; two children to support, ages 11 and 7. |
| Mrs. B. H. | 61 | ,, | £1 10s. | £44 | Suffers from rheumatism and chronic bronchitis; old and unable to work. Last grant. |

RECIPIENTS FROM THE GENERAL RELIEF FUND—*continued.*

| Name | Age | District | Grant | Total | Remarks |
|---|---|---|---|---|---|
| Mrs. A. L. .. | 40 | Dublin .. | £2 | £24 | Poverty; husband in asylum; child aged 13 to support; does what work she can. Last grant. |
| Mrs. E. T. .. | 38 | Northern Command | £2 | £2 | Suffers from rheumatism; has four children to support, three with poor health. |
| Mrs. L. M. .. | 42 | Dover .. | £1 10s. | £47 | Bad health; has to maintain crippled child. Last grant. |
| Mrs. C. C. .. | 65 | Aldershot .. | £1 16s. | £25 12s. | Chronic invalid; unable to work. |
| Mr. G. G. .. | 37 | ,, .. | £2 | £4 | Totally blind; wife is paralysed; child aged 3 to support. |
| Mr. C. C. W. .. | 59 | London .. | £1 | £1 | Out of work and destitute. |
| Mrs. W. A. G... | 65 | Portsmouth | £2 | £2 | Too feeble to work; eyesight failing. |
| Mr. W. L. .. | 64 | Belfast .. | £2 | £2 | Unable to work; suffers from chronic Bright's disease. |
| Mr. W. B. .. | 27 | Colchester | £1 | £1 | Out of work and destitute; wife ill; three children, ages 4 and 3 years and 3 weeks. |
| Mr. R. M. .. | 48 | London .. | £1 | £1 | Out of work and destitute. |
| Mr. T. S. .. | 38 | Portsmouth | £2 | £4 | Cannot work; lost use of limbs. |
| Mr. F. W. .. | 47 | Netley .. | £2 | £4 | Unable to work owing to paralysis. |
| Mr. W. A. D. .. | 27 | Salisbury .. | £1 | £1 | Out of work; has heart disease; wife delicate; one child aged 2. |
| Mr. J. A. .. | 43 | London .. | 10s. | 10s. | Destitute; requires help to get a fresh pedlar's licence. |
| Mr. D. G. .. | 20 | Devonport | £2 | £2 | To assist his payment whilst in a sanatorium for tubercle of lung. |
| Mr. W. C. A. .. | 63 | Woolwich | £2 | £2 | Suffers from bronchitis; unable to work. |
| Mr. J. M. .. | 38 | London .. | 10s. | 10s. | Out of work and destitute. |
| Mr. J. B. .. | 78 | Devonport | £2 | £2 | Is old, feeble, confined to bed and unable to work. |
| Mrs. L. H. .. | 57 | London .. | £1 | £1 | Out of work and destitute. |
| Mr. W. W. .. | 27 | Devonport | £2 | £2 | To enable his wife to join him in Aberdeen, where he has obtained employment. |

Total grants, £57 2s.

## BIRTHS.

ELSNER.—On July 6, at St. Anne's Villa, Limerick, the wife of Captain O. W. A. Elsner, R.A.M.C., of a son.

FOSTER.—On July 1, at Woolwich, the wife of Lieutenant J. R. Foster, R.A.M.C., of a son.

HILDRETH.—On June 12, 1908, at Maymyo, Upper Burma, the wife of Captain H. C. Hildreth, R.A.M.C., of a son.

# MARRIAGE.

WOOD—GRAY.—On July 4, at St. Peter's, Musselburgh, by the Rev. W. J. Jobling, of St. Luke's, Camberwell, S.E., John Lawrence, R.A.M.C., son of Philip Wood, Darlington, to Ethel Affleck, third daughter of William Gray, Newbigging Lodge, Musselburgh.

# DEATHS.

STOCK.—On June 17, 1908, Surgeon-Lieutenant-Colonel John Nugent Stock, retired, Army Medical Staff, aged 68. He entered the Service March 31, 1864; was promoted Surgeon Army Medical Department, March 1, 1873; Surgeon-Major, April 28, 1876; Surgeon-Lieutenant-Colonel, Army Medical Staff, March 31, 1884. Retired on April 17, 1889. His war services were as follows: South African War, 1879—Zulu Campaign, Battle of Ulundi, medal with clasp; Burmese Expedition, 1885-6, medal with clasp.

BROWNE.—On July 2, 1908, Honorary Brigade-Surgeon Charles Henry Browne, retired, Army Medical Department, aged 75. He entered the Service August 1, 1857; was promoted Surgeon, Staff, October 7, 1871; Surgeon-Major, Army Medical Department, March 1, 1873. Retired with the honorary rank of Brigade-Surgeon, August 1, 1882. His war services were as follows: Indian Mutiny, 1857-9, siege and capture of Forts of Awah and Kotah, medal with clasp.

# EXCHANGE.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

# Notices.

## EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only, they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," Royal Army Medical College, Millbank, London, S.W.

Communications have been received from Serjeant Dewberry, The Rev. S. Smartt, Major Wade Brown, Lieutenant-Colonel W. G. Macpherson, C.M.G., Captain S. C. Bowle, Major J. C. B. Statham, Captain Harvey, Captain Hayes, Lieutenant-Colonel H. Hathaway, Major W. O. Beveridge, Surgeon-Captain R. Samut, Major F. W. Begbie, Captain J. H. Douglas, Lieutenant-Colonel J. B. Buchanan, Major R. J. Blackham, Lieutenant J. R. Foster, Captain O. Ievers, Serjeant H. Ladwick, Lieutenant-Colonel R. Caldwell, Major H. A. L. Howell, Captain O. Elsner, Captain H. C. Hildreth, Major S. F. Clark, Major N. Faichnie, Captain C. H. Turner, Captain Cuthbert, Chairman Liverpool School of Tropical Medicine, Lieutenant-Colonel J. J. Falvey, Major Brazier-Creagh, Major A. H. Waring.

The following periodicals have been received:—
*British: Medical Press and Circular, Lancet, British Medical Journal, St. Thomas's Hospital Gazette, The Hospital, Guy's Hospital Gazette, Army and Navy Gazette, Australian Medical Gazette, Indian Medical Gazette, Journal of Hygiene, Proceedings of the Royal Society of Medicine, The Royal Engineers' Journal, On the March, Journal of the Royal Sanitary Institute, The Medical Review, The British Journal of Tuberculosis, The Red Cross News, St. Bartholomew's Hospital Journal, The Quarterly Journal of Medicine, Journal of the Royal Institute of Public Health, Medical Press and Circular, Journal of Tropical Medicine and Hygiene; Annals of Tropical Medicine and Parasitology, University of Liverpool,* Nos. 2 & 3; *The Middlesex Hospital Journal, Journal of the Röntgen Society, Transvaal Medical Journal, Journal of the Royal United Service Institution, The Australasian Medical Gazette, Journal of the United Service Institution of India.*

*Foreign: Der Militärarzt, Internationales Centralblatt Tuberkulose-Forschung, The American Military Surgeon. Le Caducée, Bulletin de l'Institut Pasteur, Le Mois Médico-chirurgical, Norsk Tidsskritf for Militærmedicin, Annali di Medicina Navale, Archiv fur Schiffs- und Tropen Hygiene, Archives de Médecine et de Pharmacie Militaires, Sanitätsbericht über die Kaiserlich Deutsche Marine, Revista de Sanidad Militar y La Medicina Militar Espanola, Russian Medical Journal, The Philippine Journal of Science, The Bulletin of the Johns Hopkins Hospital, American Medicine.*

## MANAGER'S NOTICES.

The JOURNAL OF THE ROYAL ARMY MEDICAL CORPS is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

**Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 25th of each month.**

**It is requested that all Cheques or Postal Orders for Subscriptions to the Journal, Corps News, Reprints, &c., be crossed "Holt & Co.," and made payable to the "Hon. Manager, Journal R.A.M.C.," and not to any individual personally.**

All communications for the Hon. Manager regarding subscriptions, &c., should be addressed to

THE HON. MANAGER,
"JOURNAL OF THE ROYAL ARMY MEDICAL CORPS,"
WAR OFFICE, WHITEHALL, S.W.

# JOURNAL

OF THE

# ROYAL ARMY MEDICAL CORPS.

## Corps News.

SEPTEMBER, 1908.

### ARMY MEDICAL SERVICE.—GAZETTE NOTIFICATIONS.

COLONEL William W. Kenny, M.B., to be Surgeon-General, *vice* R. H. Quill, M.B., retired, dated June 8, 1908.

Lieutenant-Colonel Harold G. Hathaway, from the Royal Army Medical Corps, to be Colonel, *vice* W. W. Kenny, M.B., dated June 8, 1908.

### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Henry J. Barnes, half-pay, is placed on retired pay, dated July 18, 1908. He entered the Service February 5, 1881; was promoted Surgeon-Major, Army Medical Staff, February 5, 1893; Lieutenant-Colonel, Royal Army Medical Corps, February 5, 1901; placed on temporary half-pay on account of ill-health, July 18, 1903. His war services are as follows: South African War, 1900-1. Operations in Orange River Colony, including actions at Wittebergen. Operations in Cape Colony, south of Orange River. Queen's Medal with 3 clasps.

Lieutenant George W. Heron is seconded for service with the Egyptian Government, dated July 1, 1908.

Lieutenant Thomas F. Lumb resigns his commission, dated July 29, 1908.

Lieutenant-Colonel Hugh B. Mathias, D.S.O., is seconded for service with the Egyptian Army, dated July 23, 1908.

The undermentioned Captains to be Majors, dated July 29, 1908: George B. Riddick, Henry Hewetson, George E. F. Stammers, Charles F. Wanhill, Wilfrid E. Hudleston, Martin F. Corkery.

Lieutenant Ronald E. Todd, M.B., from the seconded list to be Lieutenant, dated July 29, 1908.

Quartermaster and Honorary Lieutenant Thomas J. Jacomb is placed on temporary half-pay on account of ill-health, dated July 30, 1908.

**ARRIVALS HOME ON LEAVE.**—From India: Colonel P. M. Ellis; Lieutenant-Colonels G. F. H. Marks, E. H. L. Lynden-Bell; Major J. F. Duggan; Captains H. G. Pinches, A. L. Otway, D. Ahern, B. H. V. Dunbar, F. M. M. Ommanney. From Malta: Colonel J. G. MacNeece; Captain H. C. Winckworth. From Egypt: Colonel J. M. Jones; Majors F. W. Hardy, J. C. Jameson; Lieutenant G. H. Rees. From West Africa: Captain J. W. Houghton. From Gibraltar: Lieutenant-Colonel R. W. Ford; Major H. A. Berryman.

**ARRIVALS HOME.**—Time expired: Surgeon-General W. Donovan, C.B., from South Africa; Captains W. J. S. Harvey, A. L. Scott, from West Coast of Africa.

**DIPLOMAS.**—Captain T. C. Lauder obtained the Diploma in Tropical Medicine and Hygiene of the University of Cambridge. Captain D. S. Skelton obtained the Diploma in Public Health, London. Captain A. H. Safford obtained the Diploma in Public Health, London.

**EXCHANGES.**—Lieutenant-Colonel C. J. Macdonald and Major E. W. Slayter; Captains T. C. Lauder and P. S. O'Reilly, L. E. L. Parker and J. Matthews, O. W. A. Elsner and H. S. Taylor, A. E. Thorp and B. A. Craig.

**APPOINTMENTS.**—Lieutenant-Colonel R. Kirkpatrick, C.M.G., Medical Charge, Military Hospital, Devonport; Colonel C. A. Webb, Staff Officer to Army Medical Officer, North Midland Division, Territorial Force; Lieutenant-Colonel T. P. Woodhouse, Charge of Royal Victoria Hospital, Netley; Lieutenant-Colonel C. H. Melville as Professor of Hygiene at Royal Army Medical College; Major W. H. Horrocks as Expert in Sanitation to Army Medical Advisory Board; Captain L. N. Lloyd, D.S.O., to be Adjutant Royal Army Medical Corps School of Instruction, 1st and 2nd London Division, Territorial Force; Colonel H. G. Hathaway as Administrative Medical Officer of the Portsmouth District; Lieutenant-Colonel H. J. R. Moberley as Principal Medical Officer at Hong Kong.

**POSTINGS.**—Lieutenant-Colonel T. P. Woodhouse to Netley; Major H. C. Thurston to London District; Captain D. S. Skelton to Eastern Command; Lieutenant A. C. Vidal to Southern Command.

**TRANSFERS.** — Lieutenant-Colonel R. Kirkpatrick, C.M.G., from Western to Southern Command; Captain L. N. Lloyd, D.S.O., from Eastern Command to London District.

**EXTENSION OF APPOINTMENTS.** — Lieutenant-Colonel Sir J. Fayrer, Bart., appointment at Duke of York's School extended for one year. Lieutenant-Colonel T. H. F. Clarkson, appointment at Tower of London extended for one year.

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His Majesty the King has approved of the grant of a Good Service Reward to Surgeon-General C. D. Madden, C.B., K.H.S., *vice* Surgeon-Major-General Sir J. A. Hanbury, K.C.B., deceased.

The Senate of the University of London have decided that the Royal Army Medical College shall be admitted as a School of the University in the Faculty of Medicine for officers of the Royal Army Medical Corps.

## TERRITORIAL FORCE. ROYAL ARMY MEDICAL CORPS.

*Eastern Mounted Brigade Field Ambulance.*—Major Edmund Frederick Bindloss (Brigade-Surgeon-Lieutenant-Colonel, Senior Medical Officer, Bedford Volunteer Infantry Brigade), from the Bedford Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain Edward John Cross, M.D., from the 4th (Hunts) Volunteer Battalion, the Bedfordshire Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Oliver Smithson to be Lieutenant, dated May 6, 1908.

*South-Eastern Mounted Brigade Field Ambulance.*—Lieutenant Percy Charles Burgess, from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Frederick Boileau Treves to be Lieutenant, dated April 1, 1908.

Samuel Roger Thomas Anton Montagu Williams is appointed Transport Officer, with the honorary rank of Lieutenant, dated April 1, 1908.

*1st South Midland Mounted Brigade Field Ambulance.*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel William Henry Bull (Brigade-Surgeon-Lieutenant-Colonel, Senior Medical Officer, South Midland Volunteer Infantry Brigade), from the 1st Bucks Volunteer Rifle Corps, to be Lieutenant-Colonel, with the honorary rank of Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Captain Charles John Deyns, from the Home Counties Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Douglas William Anderson Bull to be Lieutenant, dated May 13, 1908.

Alfred William Moore to be Lieutenant, dated May 13, 1908.

Gurney White Buxton to be Lieutenant, dated May 13, 1908.

*South Wales Mounted Brigade Field Ambulance.*—Captain and Honorary Major Francis Henry Thompson, from the Welsh Border Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Captain James McKean Harrison, M.B., from the Welsh Border Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

John Robert Isaac Raywood (late Surgeon-Captain, 5th Volunteer Battalion, the South Wales Borderers) to be Captain, dated May 27, 1908.

Albert Willis Warren Swettenham to be Lieutenant, dated May 27, 1908.

*1st South-Western Mounted Brigade Field Ambulance.*—Major Henry John Mackay, M.B., from the Wilts and Dorset Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major George Rodway Swinhoe, from the 2nd Volunteer Battalion, the Duke of Edinburgh's (Wiltshire Regiment), to be Major, dated April 1, 1908.

Thomas Horatio Haydon, M.B., to be Lieutenant, dated May 16, 1908.

Arthur Sidney Gedge to be Lieutenant, dated May 16, 1908.

James Cecil Burton to be Lieutenant, dated May 16, 1908.

*2nd South-Western Mounted Brigade Field Ambulance.*—Captain Richard George Worger, from the Wilts and Dorset Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, dated April 1, 1908.

*Welsh Border Mounted Brigade Field Ambulance.* – Lieutenant-Colonel George William Sidebotham, from the Cheshire Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

*1st East Anglian Field Ambulance.* —Major and Honorary Lieutenant-Colonel Stanley Stanton Hoyland, from the Harwich Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain Francis Augustus Brooks, from the 1st Suffolk and Harwich Royal Garrison Artillery (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Captain William Alexander Gibb, M.D., from the Harwich Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Ernest Victor Gostling to be Lieutenant, dated May 6, 1908.

Walter James Rice to be Quartermaster, with the honorary rank of Lieutenant, dated May 6, 1908.

*1st Highland Field Ambulance.*—Captain Ashley Watson Mackintosh, M.D., from the Scottish Command, Aberdeen Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

The undermentioned officers from the Scottish Command, Aberdeen Companies, Royal Army Medical Corps (Volunteers), are appointed to the Field Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain Alexander Ogston, M.B. Captain Thomas Fraser, M.B. Captain Peter Mitchell, M.D. Captain John Wallace Milne, M.B. Captain David Rorie, M.B. Lieutenant Peter Howie, M.B. Quartermaster and Honorary Lieutenant John Cromar.

*2nd Highland Field Ambulance.*—Captain Arthur Hugh Lister, M.B., from the Scottish Command, Aberdeen Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

The undermentioned officers from the Scottish Command, Aberdeen Companies, Royal Army Medical Corps (Volunteers), are appointed to the Field Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain Francis Kelly, M.D. Captain James Smart, M.B. Captain James Dickson Noble, M.B. Lieutenant John Innes, M.B. Lieutenant Lewis Davie Cruickshank, M.B. Quartermaster and Honorary Lieutenant David Hutcheon Duthie.

*3rd Highland Field Ambulance.*—Surgeon-Major William Kinnear, M.D., from the 3rd (Dundee Highland) Volunteer Battalion, the Black Watch (Royal Highlanders), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major George Halley, M.B. (since deceased), from the 1st Forfarshire Royal Garrison Artillery (Volunteers), to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Captain Alexander Edward Kidd, from the Black Watch Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant George Waterston Miller, from the 1st (City of Dundee) Volunteer Battalion, the Black Watch (Royal Highlanders), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Sidney Watson Smith, M.B. (late Captain, 3rd [Dundee Highland] Volunteer Battalion, the Black Watch [Royal Highlanders]), to be Lieutenant, dated April 1, 1908.

James Martin Smith, M.B., to be Lieutenant, dated April 1, 1908.

John Henderson Hunter, M.B., to be Lieutenant, dated April 1, 1908.

1st *London Field Ambulance.*—Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel (Honorary Captain in the Army) Richard Reginald Sleman, M.D., from the 20th Middlesex (Artists) Volunteer Rifle Corps, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major Eustace Maude Callender, from The Prince of Wales's Own, 12th Middlesex (Civil Service) Volunteer Rifle Corps, to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Major Alfred Crondson Tunstall, M.D., from the 4th or City of London Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Honorary Captain in the Army Edmond William St. Vincent Ryan (late Captain, East Surrey Bearer Company, Royal Army Medical Corps [Volunteers]) to be Captain, dated April 1, 1908.

Captain John Forbes, from the 4th or City of London Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Charles Archibald Lees, from the 4th (Hunts) Volunteer Battalion, the Bedfordshire Regiment, to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Percival George Albert Bott, M.B., from the 18th Middlesex Volunteer Rifle Corps, to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Robert Ollerenshaw, from the 4th Volunteer Battalion, the Cheshire Regiment, to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Edward Leopold Rowse, M.D., to be Lieutenant, dated April 1, 1908.

Richard Edmund Wilson to be Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*2nd London Field Ambulance.*—Captain Joseph Norwood Brown, M.D. (Brigade-Surgeon-Lieutenant-Colonel, Senior Medical Officer, 1st London Volunteer Infantry Brigade), from the 2nd London Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain John Alfred Masters, M.D., from the London Division (Electrical Engineers), Royal Engineers (Volunteers), to be Major, dated April 1, 1908.

Captain Edwin Charles Montgomery-Smith, from the 2nd London Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Supernumerary Surgeon Captain Henry Macnaughton Macnaughton-Jones, M.B., from the 4th Volunteer Battalion, Royal Fusiliers (City of London Regiment), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain William Peart Thomas, M.D., from the 1st Volunteer Battalion, the Northamptonshire Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Andrew Elliot, M.D., from the 2nd Middlesex Royal Garrison Artillery (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Frances Rowland Humphreys to be Lieutenant, dated April 1, 1908.

Connop Fitzroy Stewart Perowne is appointed Transport Officer, with the honorary rank of Lieutenant, dated April 1, 1908.

Alfred John Hammond Knights is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*3rd London Field Ambulance.*—The undermentioned officers from the London District, London Companies, Royal Army Medical Corps (Volunteers), are appointed to the Field Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908 :—

Lieutenant-Colonel James Harper, M.D. Major John Robert Whait, M.B. Captain William Salisbury Sharpe, M.D. Captain (Honorary Lieutenant in the Army) Edmund William Herrington. Captain Ernest Alfred Snape, M.D. Lieutenant Hubert Charles Phillips. Lieutenant Harold Arthur Thomas Fairbank, F.R.C.S.(Eng.). Lieutenant George Langrigg Leathes Lawson. Quartermaster and Honorary Captain James William Bennett.

Captain William Ernest Miles, from the London District, London Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

*4th London Field Ambulance.*—Major Alexander Stevenson Greenway, M.D., from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

The undermentioned officers are appointed to the Field Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908 :—

Captain John Hardie, M.B., from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers).

Captain Arthur Edward Jerman, from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers).

Lieutenant Alfred Jeffery Messent, from Transport Officer, Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), is appointed Transport Officer, with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Quartermaster James Parker Ekins, from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), is appointed Quartermaster, with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

The undermentioned officers are appointed to the Field Ambulance, supernumerary to the establishment, with rank and precedence as in the Volunteer Force, dated April 1, 1908 :—

Quartermaster and Honorary Lieutenant Herbert Edwin Middlebrooke, from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers); Quartermaster and Honorary Lieutenant Lesli Vincent Ellis, from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers).

*5th London Field Ambulance.*—The undermentioned officers from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), are appointed to the Field Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908 :—

Lieutenant-Colonel and Honorary Colonel Charles Henry Hartt.

Captain Ernest Blair Dowsett.

Lieutenant Robert Corfe.

Quartermaster and Honorary Captain Benjamin Hardcastle, from Quartermaster, the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), is appointed Transport Officer, with the honorary rank of Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Quartermaster and Honorary Lieutenant Alfred John Naylor, from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), to be Quartermaster, with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*2nd North Midland Field Ambulance.*—Evan Llewellyn Jenkins to be Lieutenant, dated June 16, 1908.

*1st Northumbrian Field Ambulance.*—George Herbert Spencer to be Lieutenant, dated May 2, 1908.

Norman Greenwood to be Quartermaster, with the honorary rank of Lieutenant, dated May 7, 1908.

*1st Welsh Field Ambulance.*—Major John William Davies, from the South Wales Border Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

The undermentioned officers, from the South Wales Border Bearer Company, Royal Army Medical Corps (Volunteers), are appointed to the Field Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908 :—

Lieutenant Thomas Donovan.

Lieutenant John O'Sullivan.

John Francis Dwyer (late Lieutenant, South Wales Border Volunteer Infantry Brigade Bearer Company) to be Lieutenant, dated April 1, 1908.

William Lewis Hopkins is appointed Transport Officer, with the honorary rank of Lieutenant, dated April 1, 1908.

Thomas Dougall is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*1st Wessex Field Ambulance.*—Captain Ransom Pickard, M.D., from the Devon Bearer Company, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Lieutenant Alexander Ward Fortescue Sayres, from the Devon Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant Leonard Robert Tosswill, from the 1st Devonshire and Somersetshire Royal Engineers (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Thomas Duncan, M.B., to be Lieutenant, dated May 5, 1908.

George Poole David Hawker, M.B., to be Lieutenant, dated May 5, 1908.

John Miller to be Lieutenant, dated May 5, 1908.

Richard Eager, M.B., to be Lieutenant, dated May 5, 1908.

John Hannaford Maunder is appointed Quartermaster, with the honorary rank of Lieutenant, dated May 5, 1908.

*3rd Wessex Field Ambulance.* — Supernumerary Surgeon-Captain and Honorary Surgeon-Major Harry Munyard Brownfield, from the 1st Volunteer Battalion, the Hampshire Regiment, to be Lieutenant-Colonel, dated April 1, 1908.

Supernumerary Surgeon-Captain Herbert James Godwin, from the 1st Volunteer Battalion, the Hampshire Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Supernumerary Surgeon-Lieutenant John Aston Swindale, from the 1st Volunteer Battalion, the Hampshire Regiment, to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Quartermaster and Honorary Lieutenant Philip Winchester Munn, from the 1st Volunteer Battalion, the Hampshire Regiment, is appointed Quartermaster with the honorary rank of Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*1st Scottish General Hospital.*—George Maitland Edmond, M.D. (late Surgeon-Major, 1st Volunteer Battalion, the Gordon Highlanders), to be Lieutenant-Colonel, dated April 1, 1908.

Captain William Acher Irvine Fortescue, M.B., from the Scottish Command, Aberdeen Companies, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

James Callan (formerly Captain, 4th [Donside Highland] Volunteer Battalion, the Gordon Highlanders) is appointed Quartermaster, with the honorary rank of Lieutenant, dated April 1, 1908.

*3rd Scottish General Hospital.*—Lieutenant Donald James MacKintosh, M.V.O., M.B., from Transport Officer, Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain Archibald Gilchrist Hay, M.D., from the 1st Dumbartonshire Volunteer Rifle Corps, to be Major, dated April 1, 1908.

Quartermaster and Honorary Captain Hugh Miller, from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), is appointed Quartermaster, with the honorary rank of Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th Scottish General Hospital.*—Supernumerary Surgeon-Major (Honorary Captain in the Army) Robert Pollok, M.B. (Brigade-Surgeon-Lieutenant-Colonel, Senior Medical Officer, Highland Light Infantry, Volunteer Infantry Brigade), from the 3rd (the Blythswood) Volunteer Battalion, the Highland Light Infantry, to be Lieutenant-Colonel, dated April 1, 1908.

Duncan Otto MacGregor, M.B., to be Major, dated June 24, 1908.

Peter Adamson Conacher is appointed Quartermaster, with the honorary rank of Lieutenant, dated June 24, 1908.

*2nd London Sanitary Company.*—Frederick Nutcombe Hume to be Major, dated June 20, 1908.

Walter Francis Corfield to be Lieutenant, dated July 4, 1908.

*Sanitary Service.* - Thomas Eustace Hill, M.B., to be Major, dated June 24, 1908.

## DISTRIBUTION OF CAPTAINS, R.A.M.C., WHO COMPLETED THE SENIOR COURSE AT THE ROYAL ARMY MEDICAL COLLEGE ON JULY 30, 1908.

| Names | Command | Names | Command |
|---|---|---|---|
| Captain W. M. B. Sparkes | Aldershot. | Captain J. T. Johnson | Northern. |
| ,, R. N. Hunt | ,, | ,, C. H. Furnivall | ,, |
| ,, A. F. Carlyon | ,, | ,, H. E. J. A. Howley | ,, |
| ,, C. E. Fleming | Eastern. | ,, E. G. Ffrench | Scottish. |
| ,, R. T. Brown | ,, | ,, R. V. Cowey | Southern. |
| ,, C. H. Straton | ,, | ,, W. Riach | ,, |
| ,, J. H. Robinson | Irish. | ,, A. R. O'Flaherty | ,, |
| ,, J. G. Foster | ,, | ,, R. F. Ellery | ,, |
| ,, J. Dorgan | ,, | ,, W. J. Waters | ,, |
| ,, R. L. Popham | ,, | ,, P. H. Henderson | ,, |
| ,, A. C. Duffey | ,, | ,, W. M. McLoughlin | Western. |
| ,, W. B. Fry | London District. | | |
| ,, J. C. Kennedy | | | |

## LIST OF CAPTAINS, R.A.M.C., WHO HAVE PASSED THE FIRST SENIOR COURSE, 1908, ROYAL ARMY MEDICAL COLLEGE.

| Names | Class certificate awarded | Acceleration in promotion | Remarks |
|---|---|---|---|
| W. J. Waters | — | — | — |
| P. H. Henderson | 2nd | 6 months | Specialist in State Medicine. |
| J. C. Kennedy | 2nd | 6 ,, | ,, Bacteriology. |
| E. G. Ffrench | — | — | — |
| A. R. O'Flaherty | 3rd | 3 ,, | — |
| W. Riach | 2nd | 6 ,, | ,, Ophthalmology. |
| R. F. Ellery | — | — | — |
| C. E. Fleming | 2nd | 6 ,, | ,, Ophthalmology. |
| R. V. Cowey | 3rd | 3 ,, | ,, Midwifery. |
| J. Dorgan | 3rd | 3 ,, | ,, State Medicine. |
| J. G. Foster | — | — | — |
| H. E. J. A. Howley | — | — | — |
| J. T. Johnson | 2nd | 6 ,, | — |
| R. L. Popham | — | — | — |
| J. H. Robinson | — | — | ,, Midwifery. |
| W. M. B. Sparkes | 3rd | 3 ,, | ,, Otology & Laryngology. |
| R. T. Brown | 2nd | 6 ,, | ,, Bacteriology. |
| W. B. Fry | 2nd | 6 ,, | ,, ,, |
| A. C. Duffey | 3rd | 3 ,, | ,, Midwifery. |
| C. H. Furnivall | 3rd | 3 ,, | — |
| R. N. Hunt | — | — | — |
| A. F. Carlyon | — | — | — |
| C. H. Straton | 2nd | 6 ,, | ,, State Medicine. |

## ROYAL ARMY MEDICAL CORPS.

List of successful candidates at the July examination, 1908: D. S. Buist; C. Ryles; S. McK. Saunders; W. E. Marshall; G. G. Collet; E. W. Vaughan; A. M. Pollard; H. Gall; T. B. Nicholls; J. B. Jones; W. G. Wright; J. A. Clark; A. T. J. McCreery; C. G. Sherlock; J. Startin; C. Clarke; A. N. R. McNeill; H. Bevis; A. R. Wright; A. W. Byrne; C. H. O'Rorke; G. S. Parkinson; T. J. Mitchell; F. H. Somers-Gardner; H. H. Leeson; S. W. Kyle; D. E. C. Pottinger; J. W. Lane; G. H. Stack; D. H. C. Macarthur.

The undermentioned Lieutenants are confirmed in that rank: Colin Cassidy; John James, M.B.; Alfred C. H. Suhr, M.B.; John E. Elloombe; Gerald J. Keane, M.D.; Harold H. Blake, M.B.; Robert M. Dickson, M.B.; Frank Worthington; Frederick H. Bradley, M.B.; Alexander L. Stevenson, M.B.; Bernard Varvill; Joseph W. Houston, M.B.; Arthur Shepherd, M.B.; Wilfred J. Dunn, M.B.; Frank B. Dalgliesh; Malcolm Leckie; Charles E. L. Harding, M.B.; Falkiner M. Howson; Arthur L. Foster; Claude M. Rigby; Alan G. Wells; Alexander E. G. Fraser; Walter H. S. Burney; Thomas S. Eves, M.B.; Leo Murphy; Arthur H. T. Davis: John S. McCombe, M.B.; William J. Tobin; Campbell McQueen.

**Promotions.**—The following promotions will take effect from the dates specified, to complete the establishment authorised for 1908-9:—

*To be Serjeant-Majors.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 10021 | Qmr.-Sjt. H. A. Ward .. | 6.4.08 | .. | *Vice* T. A. Crichton, to pension. |
| 8954 | ,, T. Grenfell .. | 17.5.08 | .. | ,, W. F. Watterton, to pension. |
| 8913 | ,, W. H. Giddings | 11.6.08 | .. | ,, B. G. Brook, to pension. |

*To be Quartermaster-Serjeants.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 9248 | Staff-Serjt. A. G. Truman | 17.4.08 | .. | *Vice* W. J. McCracken, to pension. |
| 10162 | ,, C. Drury .. | 17.5.08 | .. | ,, T. Grenfell, promoted. |
| 9053 | ,, F. J. Filmer | 11.6.08 | .. | ,, W. H. Giddings, promoted. |
| 10015 | ,, A. W. Grant | 14.6.08 | .. | ,, W. H. Scrase, to pension. |
| 8991 | ,, R. Cox .. | 1.7.08 | .. | On re-posting from Transvaal Vol. M.S.C., *vice* J. Davis, to Territorial Forces. |

*To be Staff-Serjeants.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 16507 | Serjt. G. Martin .. | 17.5.08 | .. | *Vice* C. Drury, promoted. |
| 9205 | ,, F. Judd .. .. | 8.6.08 | .. | ,, A. G. Bright, supernumerary with Territorial Forces. |
| 8288 | ,, M. Andrews .. | 11.6.08 | .. | ,, F. J. Filmer, promoted. |
| 9695 | ,, F. Yeo .. .. | 14.6.08 | .. | ,, A. W. Grant, promoted. |
| 12202 | ,, T. Connolly .. | 14.6.08 | .. | ,, F. Yeo, supernumerary with Auxiliary Forces. |
| 9039 | ,, E. Potter.. .. | 14.6.08 | .. | ,, T. Connolly, supernumerary at the War Office. |
| 10206 | ,, J. Enwright .. | 24.6.08 | .. | ,, F. L. Harsant, to pension. |
| 8680 | ,, B. Rhodes .. | 30.6.08 | .. | ,, H. Porter, to pension. |
| 8558 | ,, F. Page .. .. | 30.6.08 | .. | ,, B. Rhodes, supernumerary with Territorial Forces. |

*To be Serjeants.*

| | | | | |
|---|---|---|---|---|
| 12588 | Lce.-Serjt. J. Meason | 8.6.08 | Nursing | *Vice* F. Judd, promoted. |
| 10522 | ,, A. Holloman | 11.6.08 | ,, | ,, M. Andrews, promoted. |
| 12944 | ,, C. Jackson | 14.6 08 | General Duty | ,, E. Potter, promoted. |
| 14050 | ,, W. Andrews | 16.6.08 | ,, ,, | ,, W. G. Elcombe, to pension. |
| 14082 | ,, G. Prince | 24.6.08 | Nursing | ,, J. Enwright, promoted. |
| 15018 | ,, A. J. Davis | 30.6.08 | ,, | ,, F. Page, promoted. |

*To be Corporals.*

| | | | | |
|---|---|---|---|---|
| 18213 | Lce.-Cpl. W. C. Pacey | 1.7.08 | Nursing | To complete establishment, 1908-9. |
| 18987 | ,, G. J. Tanner | | Cooking | |
| 12768 | ,, T. R. Kent | | Nursing | |
| 12948 | ,, F. A. Neale | | ,, | |
| 12989 | ,, E. G. W. Barnes | | Q.A.I.M.N.S. | |
| 13024 | ,, W. Rider | | General Duty | |
| 13202 | ,, C. Pask | | Nursing | |
| 13469 | ,, F. Rogers | | General Duty | |
| 12183 | ,, W. J Biddle | | ,, ,, | |
| 12187 | ,, J. A. Brookes | | Nursing | |
| 12775 | ,, H. C. Prett | | Cooking | |
| 12779 | ,, G. Stubbs | | Nursing | |
| 13921 | ,, J. W. Cooper | | General Duty | |

**Appointments.**—The following appointments will take effect from the dates specified, to complete the establishment authorised for 1908-9: —

*To be Lance-Serjeants (as Dispensers).*

| | | | | |
|---|---|---|---|---|
| 11867 | Corpl. W. Wright | 1.7.08 | Nursing | To complete establishment, 1908-9. |
| 18933 | ,, H. L. Thompson | | ,, | |
| 16048 | ,, W. J. Taylor | | ,, | |
| 17485 | ,, H. Kennedy | | ,, | |
| 17973 | ,, F. Knott | | Clerical | |
| 19046 | ,, S. J. Phillips | | Nursing | |
| 18718 | ,, W. H. Parr | | Q.A.I.M.N.S. | |

*To be Lance-Corporals.*

| | | | | |
|---|---|---|---|---|
| 11015 | Private W. E. Phillips | 1.7.08 | General Duty | To complete establishment, 1908-9. |
| 11040 | ,, J. Stroud | | ,, ,, | |
| 11391 | ,, G. C. Maidment | | Nursing | |
| 11492 | ,, H. W. Stoner | | ,, | |
| 295 | ,, A. E. Cheer | | General Duty | |
| 12071 | ,, C. Everett | | ,, ,, | |
| 12413 | ,, E. J. Russell | | Nursing | |
| 14671 | ,, E. W. Brunton | | Cooking | |
| 16154 | ,, W. Sunderland | | Nursing | |
| 16258 | ,, P. Bartleman | | ,, | |
| 16432 | ,, J. A. White | | Q.A.I.M.N.S. | |
| 16447 | ,, J. W. Ashworth | | General Duty | |
| 15969 | ,, F. C. Dean | | ,, ,, | |
| 17084 | ,, J. Hunter | | ,, ,, | |
| 17257 | ,, J. J. Bartleet | | Cooking | |
| 17244 | ,, A. F. McArthur | | Clerical | |
| 18094 | ,, W. Burns | | General Duty | Special under para. 281, S.O. |

**Queen Alexandra's Imperial Military Nursing Service.**—The undermentioned Orderly has been selected for admission into Q.A.I.M.N.S. with increased pay at sixpence (6d.) a day, in accordance with Article 771, Royal Warrant for Pay, from the date specified :—

| No. | Rank and Name | Date | Station |
|---|---|---|---|
| 11907 | Private W. Nunn .. .. .. | 26.2.08 | Cosham. |

**Award of Army Form C 344.**—The following Non-commissioned Officers and Orderlies were successful at the recent examination for Army Form C 344, "Certificate of Training as a Nurse," held in May, 1908 :—

*Home Stations.*

| No | Rank and Name | Company | Percentage of marks | Number of candidates |
|---|---|---|---|---|
| 18157 | Private A. Pruden .. .. .. | 10 | 83 | 1 |
| 19001 | ,, J. Barritt .. .. .. | 14 | 82 | 2 |
| 19086 | ,, A. Wain . .. .. | 2 | 81 | 3 |
| 19862 | ,, L. R. Tole .. .. .. | 2 | 81 | 4 |
| 17747 | ,, F. J. Vine .. .. .. | 2 | 78 | 5 |
| 18748 | ,, W. Cummings .. .. | 18 | 78 | 6 |
| 18648 | ,, J. B. Haley .. .. .. | 12 | 78 | 7 |
| 19460 | ,, C. J. T. Payne .. .. | 18 | 77 | 8 |
| 16352 | ,, A. B. Court .. .. .. | Netley | 77 | 9 |
| 19541 | ,, F. May .. .. .. | 1 | 75 | 10 |
| 14603 | ,, C. J. File .. .. .. | 9 | 73 | 11 |
| 19249 | ,, J. Caste .. .. .. | Netley | 73 | 12 |
| 19202 | ,, F. J. R. Baiden .. .. | 7 | 72 | 13 |
| 15737 | Lce. Cpl. A. E. Thompson .. .. | Netley | 72 | 14 |
| 14391 | Private G. Boden .. .. .. | 18 | 71 | 15 |
| 19792 | ,, H. A. Baigent .. .. | 1 | 71 | 16 |
| 15538 | Lce.-Cpl. E. H. Jesson .. .. | 18 | 70 | 17 |
| 18815 | Private H. Milsom .. .. .. | 18 | 70 | 18 |
| 19857 | ,, H. Cooper .. .. .. | 18 | 70 | 19 |
| 19669 | ,, T. Joyce .. .. .. | 18 | 69 | 20 |
| 19370 | ,, T. H. Potter .. .. .. | Netley | 69 | |
| 12413 | ,, E. J. Russell .. .. .. | 18 | 67 | 21 |
| 17776 | Corpl. W. Milliken .. .. .. | 2 | 66 | 22 |
| 14880 | Private M. Farren .. .. .. | 9 | 66 | |
| 18725 | ,, I. Loweth .. .. .. | 10 | 66 | |
| 17091 | ,, J. Moore . .. .. | 1 | 65 | 23 |
| 15861 | Lce.-Cpl. J. Hindle .. .. .. | 11 | 65 | 24 |
| 19543 | Private F. E. H. Audus .. .. | 12 | 62 | 25 |
| 18427 | ,, P. Barber .. .. .. | 11 | 60 | 26 |
| | *Stations Abroad.* | | | |
| 18759 | Private T. J. Bogosoff .. .. | 33 | 74 | |
| 18984 | ,, B. Breeze .. .. .. | 33 | 74 | — |
| 18395 | ,, C. A. J. Speller .. .. | 33 | 73 | — |
| 19453 | ,, A. C. Wingate .. .. | 33 | 69 | — |
| 17964 | ,, W. Bowler .. .. .. | 30 | 63 | |
| 19336 | ,, A. Barnes .. .. .. | 33 | 60 | — |
| 19895 | ,, W. Smith .. .. .. | 30 | 59 | — |

**Nursing Section.**—The following appointments to the Nursing Section of the Corps will take effect from the dates specified :—

| No. | Rank and Name | Date | No. | Rank and Name | Date |
|---|---|---|---|---|---|
| 18337 | Corpl. C. Leaker .. | 10.2.08 | *19924 | Pte. E. D. Barr .. | 4.5.08 |
| 1095 | Pte. A. R. J. Haylett.. | 11.4.08 | 1394 | ,, F. H. Clarke .. | 18.5.08 |
| 1115 | ,, W. Beasley .. | | 701 | ,, A. E. V. Wilkins | 27.5.08 |
| 17853 | ,, W. Douglas .. | 14.4.08 | 1403 | ,, F. J. C. Garland | 30.5.08 |
| 68 | ,, P. B. Chew .. | | 1436 | ,, A. W. Glennie .. | |
| 102 | ,, D. J. Crotty .. | | 17698 | ,, A. Betterton .. | 9.6.08 |
| 146 | ,, F. W. Cottle .. | | 743 | ,, F. C. Coles .. | |
| 511 | ,, F. Beauchamp .. | | 844 | ,, B. D. Johnstone | |
| 952 | ,, F. W. Cheese .. | | *18395 | ,, C. A. J. Speller .. | |
| 223 | ,, W. Peake .. | 15.4.08 | 18518 | ,, J. W. Darlington | 11.6.08 |
| 14609 | Serjt. W. P. Oldridge | 24.4.08 | 894 | ,, W. O'Brien .. | 12.6.08 |
| 19776 | Pte. G. Swan .. .. | | 728 | ,, A. T. Brooks .. | 18.6.08 |
| 42 | ,, D. G. Harding .. | | 1440 | ,, G. Johnston .. | |
| *17123 | Lce.-Cpl. F. G. Fuller | 4.5.08 | 19775 | ,, C. Cheese .. | 30.6.08 |
| 16570 | Pte. T. Kerr .. .. | | | | |

* Reappointed.

**Advancement of Privates (Corps Pay).**— The following advancements in rate of Corps Pay will take effect from July 1, 1908 :—

*To be Advanced to the Third Rate of Corps Pay (at 8d.).*
*As Orderlies.*

| No. | Name | No. | Name | No. | Name |
|---|---|---|---|---|---|
| 12385 | Rayney, E. A. | 17091 | Moore, J. | 19192 | Poole, F. |
| 12417 | Weller, S. | 17489 | Brockley, A. | 19419 | Clark, W. G. W. |
| 14673 | Didron, G. | 18438 | Boyes, L. | 19713 | Wadmore, A. E. |
| 15006 | Taylor, A. J. | 18516 | Reynolds, F. G. | 19820 | Stagg, H. W. |
| 16262 | Brown, A. | 19086 | Wain, A. | 19863 | Mattison, W. H. |

*As Clerks.*

| | | | | | |
|---|---|---|---|---|---|
| 18019 | Julyan, J. G. .. | 19468 | Jack, G. D. .. | 19471 | Johnson, D. C. |
| 18468 | Buchanan, W. H. | | | | |

*To be Advanced to the Fourth Rate of Corps Pay (at 6d.).*
*As Orderlies.*

| | | | | | |
|---|---|---|---|---|---|
| 16931 | Langtree, W. | 19432 | Parker, W. T. | 19884 | Hort, F. E. |
| 16979 | Egan, R. V. V. | 19505 | Baugh, E. H. | 19974 | Wainwright, J. |
| 17972 | Burgess, G. | 19605 | Nairn, M. | 56 | Quinn, C. |
| 18452 | Stammers, G. H. | 19609 | Aldridge, F. J. | 105 | Newman, F. |
| 18474 | Kelly, C. | 19710 | King, H. S. | 147 | Lintott, W. |
| 19110 | Smith, C. H. | 19721 | Walsh, C. F. | 218 | Dale, L. A. |
| 19246 | Laing, J. | 19747 | Hyde, C. H. | 272 | Pout, R. N. |
| 19272 | Lee, W. J. | 19810 | Cooke, F. C. | 380 | Hort, L. J. |
| 19322 | Elliott, H. | 19857 | Cooper, H. | 874 | Johnson, F. A. |
| 19359 | Jarvis, J. A. | 19862 | Tole, L. R. | | |

*As Clerks.*

| | | | | | |
|---|---|---|---|---|---|
| 12947 | Henderson, M. | 19240 | Scasbrook, T. C. S. | 11 | Andre, J. |
| 18202 | Hinton, J. W. G. | 19618 | Bettison, P. | 17 | Berry, A. C. |
| 18291 | Johnston, G. | 19640 | Hollands, G. H. | 192 | Murray, J. |
| 18327 | Beattie, G. | 19763 | Luxon, A. J. | 408 | Kniep, O. |
| 18504 | Hall, W. J. | 19851 | Claydon, P. E. | 586 | Gordon, W. A. |
| 18524 | Smitherman, T. H. | 19883 | Hamilton, G. J. | 820 | Harvey, C. F. |

*As Cooks.*

| | | | | | |
|---|---|---|---|---|---|
| 13467 | Nuding, G. T. | 18332 | Bevan, B. B. | 19033 | Fisher, F. |
| 17161 | Riley, J. | 18379 | White, A. | 19177 | Sheat, R. |
| 17181 | Craig, J. | 18563 | Avery, G. | 19416 | Harper, F. E. |
| 17442 | Wilkenson, J. O. | 18611 | Crutchley, E. | 19853 | Bonehill, W. A. J. |
| 17519 | Boxall, A. | 18624 | Ellis, J. | 19941 | Gowing, E. P. |
| 17671 | Sweeney, J. | 18838 | Ward, J. R. | 19946 | Hillier, H. J. |
| 18083 | Gleave, J. | 18859 | Day, M. | 39 | Webb, C. E. |
| 18331 | Waters, H. | | | | |

The following advancements in rate of Corps Pay will take effect from January 1, 1908: To the Third Rate at 6d., as an Orderly, 16737 Private E. Nevard; as a Clerk, 17727 Private A. Wrigley. To the Fourth Rate at 6d., as an Orderly, 19259 Private A. W. Burrows; as a Cook, 19386 Private H. E. Game.

**Sanitary Orderlies.**—The following Privates are advanced to the Fourth Rate of Corps Pay at 6d. as Sanitary Orderlies, from the dates specified:—

| No. | Name | Date | No. | Name | Date |
|---|---|---|---|---|---|
| 130 | Dillon, T. B. J. | 1.3.08 | 717 | Travis, O. | 25.5.08 |
| 660 | Dotterill, H. C. | | 738 | Ryan, M. | |
| 845 | Hosken, N. R. | | 402 | Sebeck, A. | 1.6.08 |
| 18423 | Hanks, R. C. | 25.3.08 | 823 | Martin, R. | |
| 18529 | Christie, J. | 29.3.08 | 616 | Wilson, F. M. | 8.6.08 |
| 1375 | Shipton, H. | 11.4.08 | 1422 | Wright, J. | 9.6.08 |
| 19823 | Kilyon, T. J. | 18.4.08 | 1583 | Elston, S. G. | 17.6.08 |
| 19376 | Buss, F. E. | 27.4.08 | 14785 | Tweed, B. | 21.6.08 |
| 17820 | Peckham, H. | 5.5.08 | 18697 | Shenton, R. J. | |
| 15995 | Whittaker, J. | 16.5.08 | 1381 | Finnegan, J. | 22.6.08 |
| 239 | Witcombe, R. G. | 18.5.08 | 1447 | Conway, P. | |
| 77 | Towner, A. E. | 20.5.08 | 18235 | Harding, G. | 1.6.08 |

**Advancement of Privates (Corps Pay).**—The advancement to the Fourth Rate of Corps Pay at 6d., as an Orderly, of 19276 Private J. J. Young, notified in Corps Order No. 16, of 1908, is hereby cancelled.

**Buglers.**—The following Boys are appointed Buglers from the dates specified: 1083 W. H. S. Lodge, May 9, 1908; 1406 F. H. Newland, May 9, 1908; 19960 R. J. Grizzell, May 27, 1908.

**Reversions.**—The following Lance-Corporals are reverted to their permanent grade, at their own request, from the dates specified · 16481 W. W. Bee, April 23, 1908; 14956 E. J. Stangroom, June 22, 1908.

**LIST OF CASUALTIES:—**

*Discharges.*—7818 Quartermaster-Serjeant J. Wilton, July 18, 1908, termination of second period; 6399 Quartermaster-Serjeant F. S. Marsland, July 29, 1908, after three months notice; 7833 Staff-Serjeant H. H. Heading, July 29, 1908, termination of second period; 18078 Corporal W. Ralfe, July 25, 1908, termination of engagement; 9458 Corporal W. Best, August 4, 1908, medically unfit; 7840 Private E. Watkins, August 2, 1908, termination of second period; 11109 Private F. W. Allen, July 13, 1908, termination of first period; 18844 Private W. Grant, August 5, 1908, medically unfit; 1460 Private J. Dias, August 14, 1908, medically unfit.

*Transferred to Army Reserve.*—1122 Private P. Goodwin, July 11, 1908; 1124 Private H. Warren, July 16, 1908; 1123 Private C. J. Hiron, July 14, 1908; 19690 Private A. Fowler, July 13, 1908; 1128 Private J. F. Ellicock, July 17. 1908; 14379 Private A. J. Lawrens, July 16, 1908; 18914 Private E. Price, July 16, 1908; 1133 Private F. Broughton, July 16, 1908; 1134 Private R. Mitchell, July 18, 1908; 1129 Private J. Mills, July 18, 1908; 1130 Private R. H. King, July 18, 1908; 19703 Private

P. T. Bridle, July 21, 1908; 14391 Private G. Boden, July 22, 1908; 1137 Private F. W. D. Walker, July 23, 1908; 1139 Private C. A. V. Williams, July 23, 1908; 19706 Private W. J. Leaman, July 24, 1908; 1138 Private F. J. Murray, July 23, 1908; 1142 Private G. Burills, July 25, 1908; 1147 Private G. Carr, July 30, 1908; 1144 Private H. Roberts, July 29. 1908; 1143 Private P. Haley, July 29, 1908; 19713 Private A. E. Wadmore, July 26, 1908; 19717 Private H. Collins, July 28, 1908; 19716 Private F. Reynolds, July 30, 1908; 1148 Private D. Moss, July 30, 1908; 1151 Private T. Murphy July 31, 1908; 13712 Private H. S. Tumber, July 26. 1908; 1157 Private A. E. Gray, August 1, 1908; 1158 Private S. Livesey, August 2, 1908; 19727 Private A. D. Johns, August 3, 1908; 19728 Private L. Jackson, August 4, 1908; 1160 Private E. L. Brewer, August 5, 1908; 19736 Private C. G. Bates, August 8, 1908; 14450 Private J. R. Roy, August 5, 1908; 1162 Private A. Hoare, August 6, 1908; 1163 Private W. Hodgkiss, August 6, 1908; 14434 Corporal J. D. Dobson, August 6, 1908; 14435 Lance-Corporal M. Boyd, August 6, 1908, 19735 Private P. W. Strudwick, August 7, 1908; 1165 Private W. Glade, August 5, 1908; 14469 Serjeant A. B. Mackenzie, August 10, 1908.

*Transfers from other Corps.*—1858 Private J. Hillier, August 3, 1908, from 1st Leinster Regiment; 7425 Staff-Serjeant T. Lever, August 10, 1908, from Instructor, Royal Army Medical Corps (M.).

*Transfers to other Corps.*—9467 Staff Serjeant C. J. Tunn, July 20, 1908, to 1st Home Counties Field Ambulance; 7679 Staff-Serjeant C. Warner, July 9, 1908, to Territorial School, Exeter; 9910 Serjeant E. H. Beeton, July 10, 1908, to 2nd West Riding Field Ambulance; 9747 Serjeant C. Williams, July 16, 1908, to 2nd South Midland Field Ambulance; 8439 Serjeant E B. Snowden, July 22, 1908, to East Anglian School of Instruction; 1711 Private F. E. Sadler, July 7, 1908, to 2nd Lincoln Regiment; 19978 Private J. T. Hutton, July 20, 1908, to 1st Life Guards; 14633 Private F. C. Henry, August 1, 1908, to Royal Garrison Artillery; 124 Private A. R. Greenfield, August 7, 1908, to 2nd Sussex Regiment.

*Appointments.*—19029 Private R. E. Harvey, July 2, 1908, to be Lance-Corporal, special under para. 281 Standing Orders, 306 Boy F. G. Quelch, July 29, 1908, appointed Bugler; 1464 Boy J. Fitzgerald, July 29, 1908, appointed Bugler.

*Arrivals Home from Abroad.*—16955 Private C. White, July 9, 1908, from Hong Kong; 19972 Private H Davies, July 11, 1908, from South Africa; 18513 Private A. Holland, July 1. 1908, from Egypt; 8086 Quartermaster-Serjeant W. Gough, July 11, 1908, from South Africa; 19046 Corporal S. J. Phillips, July 14, 1908, from Sierra Leone; 18940 Corporal P. H. Musgrave, July 14, 1908, from Sierra Leone; 18061 Private W. Cairns, July 14, 1908, from Sierra Leone; 18743 Private H. Worrad, July 14, 1908, from Sierra Leone; 11443 Private H, Cliburn, August 8, 1908, from Malta.

*Embarkations for Abroad.*—To Sierra Leone, June 12, 1908.—18445 Corporal J. E. Crawley, 18158 Corporal G. P. Pursey, 17573 Lance-Corporal C. Harlen, 18966 Private A. E. Whitney.

### THE FOLLOWING N.C.O.'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*Dispensers.*—11700 Corporal M. Stroud, 19093 Private A. Lane, 11566 Private W. T. Brown, 18902 Private W. Blundell.

*For Staff-Serjeants.*—8808 Serjeant C. Davies, 14663 Serjeant P. Snow, 11728 Serjeant F. J. Jarvis, 9436 Serjeant L. E. W. Tempest, 9144 Serjeant V. F. Meredith, 11403 Serjeant R. E. Wagstaffe, 9903 Serjeant R. T. Pack, 9896 Serjeant J. R. Storey.

*For Serjeants.*—9436 Serjeant L. E. W. Tempest, 10400 Lance-Serjeant F. F. Catley, 10436 Corporal F. Evans, 18985 Corporal S. Shaw, 9351 Corporal G. Howard, 11789 Corporal W. Skinner, 7896 Serjeant W. B. Neilan.

*For Corporals.*—17865 Private A. Abbatt, 18093 Private G. Ryan, 17787 Private A. H. Wyatt, 17450 Private W. J. Elsey, 19895 Private W. Smith. 13018 Private G. Turner, 17728 Private T. Hynes, 19102 Private H. C. Hughes, 11392 Private Connor, 874 Private F. A. Johnson, 11895 Private J. Higgins, 73 Private F. Ellard, 19030 Private R. S. Mann, 1336 Private C. Dovey, 19347 Private A. J. White.

## EXTRACTS FROM THE "LONDON GAZETTE," DATED AUGUST 13, 1908.

**The following are extracts from a despatch from Major-General Sir J. Willcocks, K.C.M.G., C.B., D.S.O., regarding the recent operations on the Mohmand Border, in the Khyber, and in the country of the Mohmands, which was published in a supplement to the *London Gazette* of August 13, 1908.**

(30) "The . . . medical arrangements were all satisfactory, and the good work done by the Army Bearer Corps was most praiseworthy.

(32) "I recommend the following officers for a reward for their distinguished service in the field:—

"Medical Services.

"Major O. R. A. Julian, C.M.G., R.A.M.C.

(33) "The undermentioned officers did exceptionally good work:—

"Colonel H. R. Whitehead, R.A.M.C.

"The King has been graciously pleased to give orders for . . . the following promotions in the Army, in recognition of their services in connection with the recent operations against the Zakka Khel and Mohmands, the whole to bear date July 16, 1908:—

"Brevet.

"To be Lieutenant-Colonel,

"Major Oliver Richard Archer Julian, C.M.G., R.A.M.C."

**NOTES FROM ALDERSHOT.**—Royal Army Temperance Association, Depôt, Royal Army Medical Corps Branch. Private J. C. Reynolds writes (August 20, 1908): "The second annual outing of the above branch took place on Wednesday, August 12, and proved a great success. The party consisted of eighty-nine members. The place selected by the Committee this year was Brighton, and subsequent events proved the selection to have been a wise one. We started from Aldershot at 7.30 a.m., and arrived at Brighton at 10.45 a.m. We proceeded straight to the Washington Hotel, West Street, where it had been arranged we were to have our meals, so that all might be able to find it later in the day. The dinner and tea were all that could be desired, and there is no doubt that the excellent catering added very greatly to the success of the trip. The party divided up and amused themselves throughout the day by seeing the sights of Brighton, and by boating and bathing, and in various other ways, every man to his liking. We started our return journey to Aldershot at 8.50 p.m. and arrived home at 12.30 a.m., having spent a most enjoyable day. The thanks of all are due to Serjeant Robinson, and the committee, who spared no pains to make the day a success. We all regretted that the outing could not have been arranged earlier in the year, when our membership was much larger, so that many more could have shared our enjoyment."

**NOTES FROM FERMOY.**—Serjeant Roberts writes (August 8, 1908): "Surely no Corps News has ever reached the Editorial chair from this part of the Empire; better late than never, so here's for a start. We recently played a cricket match against the Headquarter detachment, Cork. The event, I am informed, was without precedent in the history of both detachments; it took place in Fermoy, and we were beaten by 10 runs. I will not mention the scores except to say that Private Scrubby, for Cork, and Private Bailey, for Fermoy, were top scores, with 18 and 19 respectively. It will suffice when I say that both teams played to a finish, neither entertaining the idea of 'declaring.' We are losing a very good bowler in No. 18443 Private Harris, ordered to Ceylon.

"Major C. W. R. Healy, Major D. Shanahan, and Captain B. Watts are under orders to proceed from here to India shortly. Lieutenant-Colonel C. J. MacDonald, who was ordered to India, has effected an exchange with Major E. W. Slayter.

"The following have joined the Cork district and proceeded to stations noted: Captain J. H. Robinson, Fethard; Captain J. G. Foster, Kilkenny; Captain J. Dorgan, Fort Carlisle. Quartermaster-Serjeant W. N. Speedy, No. 10880 Serjeant Fitzgerald, and No. 17057 Corporal M. Ward recently arrived here for duty.

"Serjeant-Major G. H. Roberts was successful in passing the examination in Military Law held in May last at Cork."

**NOTES FROM MALTA.**—Major C. M. Fleury writes (August, 1908):—

"**GRAND CONCERT AT IMTARFA.**

"Proceeds of concert will be given to Regimental Fund for Serjeant McKerrow, a Crimean veteran.

"PROGRAMME.

"*Part I.*

| | | | |
|---|---|---|---|
| (1) | *Overture* | | BAND 4TH WORCESTERSHIRE REGT. |
| (2) | *Comic Song* | | Pte. HUGHES, R.A.M.C. |
| (3) | *Recitation* | 'The Defence of Rorke's Drift' | Boy POWLES, 4TH W.R. |
| (4) | *Comic Song* | 'How I swam the Channel' | Pte. BAUGH, R.A.M.C. |
| (5) | *Song* | 'By kind permission of the *Daily Mail*' | Pte. MURPHY, R.A.M.C. |
| (6) | *Part Song* | 'Sweet and Low' | BOYS AND GIRLS OF SUNDAY SCHOOL. |
| (7) | | 'A Learned Dissertation on Moons, Suns, Stars, Comics and others' | Prof. MOONAY EYE. |

"(Interval of Five Minutes.)

"*Part II.*

| | | | |
|---|---|---|---|
| (8) | *Overture* | | BAND 4TH WORCESTERSHIRE REGT. |
| (9) | *Comic Song* | | Pte. HUGHES, R.A.M.C. |
| (10) | *Recitation* | | Rev. C. A. PEACOCK, M.A., C.F. |
| (11) | *Song* | Selected | Pte. MURPHY, R.A.M.C. |
| (12) | *Variety Turn* | 'The Zig-Zags' | Sjt. SPOWAGE and Pte. HUGHES, R.A.M.C. |
| (13) | *Song* | Selected | Pte. BAUGH, R.A.M.C. |
| (14) | *A Comic Sketch,* entitled : | | |

"'LOSS OF THE INVENTOR.'

"*Characters.*

| | |
|---|---|
| *Sir Chas. Godfray* (a gentleman of means) | Pte. HUGHES, R.A.M.C. |
| *Jack of all Trades* | Pte. BAUGH, R.A.M.C. |
| *A Fisherman* | Sjt. SPOWAGE, R.A.M.C. |

"GOD SAVE THE KING.

"The above, as per programme, was given at Imtarfa ; the proceeds were given in aid of Serjeant McKerrow, a Crimean veteran. The result was a 'full house.' As will be seen from the programme, owing to one man of the 4th Worcestershires not turning up, the bulk of the programme fell on the Royal Army Medical Corps, who acquitted themselves splendidly. Privates Baugh and Murphy fairly brought down the house with their respective songs. No. 7, by Professor Moonay Eye, turned out to be by our old friend Serjeant Spowage, R.A.M.C., and for fully fifteen minutes he kept the house in roars of laughter. The recitation by our new Chaplain, Rev. C. A. Peacock, was extremely witty, and a loud round of applause terminated his effort. Private Murphy, R.A.M.C., singing one of Harry Lauder's songs in costume, was loudly applauded, and he fully deserved the ovation he received. In No. 12 our old friends, Serjeant Spowage and Private Hughes, of the Corps, again appeared. The audience were kept in roars of laughter, one 'hit' in particular being worthy of mention. 'When was the Malta Railway first mentioned in the Scriptures?' Answer, 'When the Lord created all creeping things.' The appropriateness of this wheeze will be obvious to all who know Malta and its surroundings. The comic sketch, 'Loss of the Inventor,' again brought down the house, and in this Serjeant Spowage, assisted by Privates Hughes and Baugh, R.A.M.C., brought off a great success, indeed one of the best of the evening. It was one of the best comic sketches ever put before a soldier audience, and, needless to add, was greeted with roars of applause.

"Although small, the Imtarfa detachment is quite capable of holding its own, and the result from a financial point of view, I hope, fully justified the Rev. C. A. Peacock's efforts, to whom all praise is due for getting up this concert."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. F. S. Henderson, Secretary to P.M.O., His Majesty's Forces in India, writes under date July 16, 1908:—

"*Appointments.*—Surgeon-General A. T. Sloggett, C.M.G., on arrival in India will be appointed Principal Medical Officer, 6th (Poona) Division.

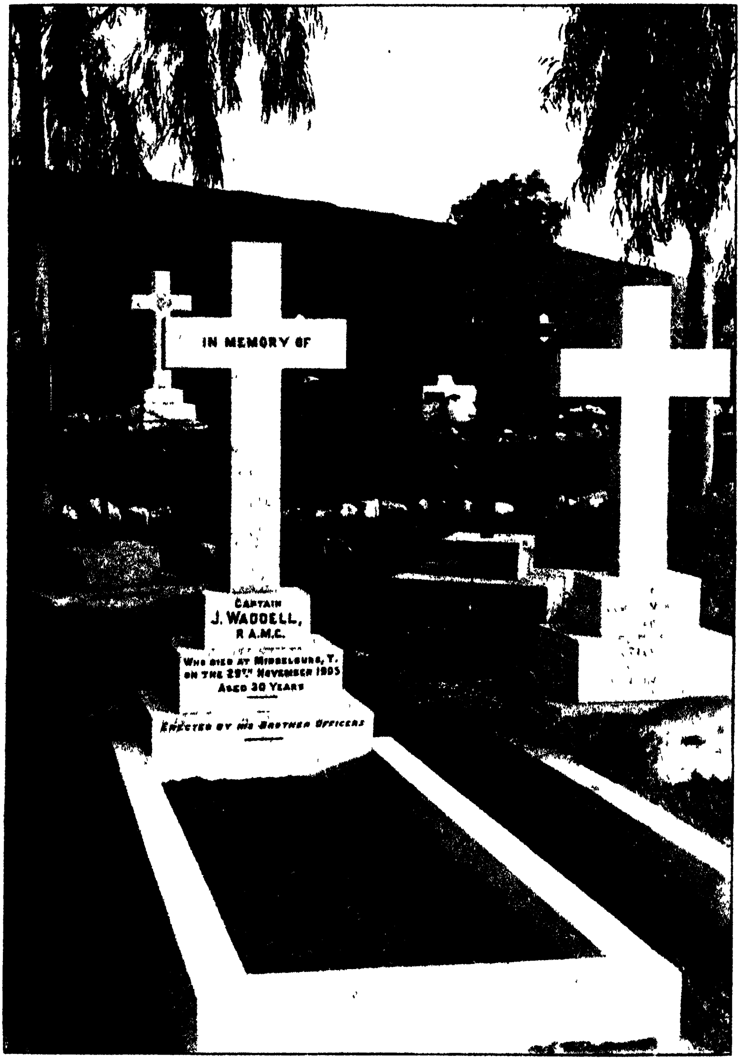
"Lieutenant-Colonel L. E. Anderson, on arrival in India, has been appointed Principal Medical Officer, Allahabad and Fyzabad Brigades.

"*Extension.*—Lieutenant-Colonel P. C. H. Gordon has been permitted to extend his tour of Indian service for one year, until the trooping season of 1909-10.

"*Leave.*—Colonel H. R. Whitehead has now been granted ninety days privilege leave, instead of six months and nineteen days general leave, ex-India.

"Lieutenant-Colonel M. W. O'Keefe, granted ninety days privilege leave, ex-India."

☞ **NOTES FROM SOUTH AFRICA.**—Memorial to the late Captain J. Waddell, R.A.M.C. Lieutenant-Colonel O'Halloran writes, July 27, 1908: "I send you a photo of Memorial to the late Captain J. Waddell, R.A.M.C., who died at Middelburg, Transvaal, in 1905, whilst I was in charge at that station.


IN MEMORY OF
CAPTAIN
J. WADDELL,
R.A.M.C.
WHO DIED AT MIDDELBURG, T.
ON THE 29TH NOVEMBER 1905
AGED 30 YEARS
ERECTED BY HIS BROTHER OFFICERS

"The cross and curbing are of white freestone, and the work has been neatly executed. It will be noticed on the right of photo that a similar memorial has been erected by the father of the late Lieutenant G. S. Mackay, R.A.M.C., who died shortly after, and was buried beside Captain Waddell. The graveyard where soldiers and civilians are interred is somewhat typical of South Africa, showing the silent veldt in the background, and is now looked after by the Department of Public Works. All officers of our Corps in South Africa have subscribed, and I have forwarded three copies of photo to Captain Waddell's widow. A small balance remains, which I trust will not be required in this country."

### QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following ladies have received appointments as Staff Nurse: Miss M. Kearney, Miss E. C. E. Lindsay.

*Appointments.*—The undermentioned lady has been appointed matron, Queen Alexandra's Imperial Military Nursing Service: Miss E. A. Dowse, Superintendent, A.N.S.

*Postings and Transfers.*—Sisters. Miss C. K. E. Steel, to Royal Victoria Hospital, Netley, from Royal Herbert Hospital, Woolwich; Miss W. G. Massey, to Royal Herbert Hospital, Woolwich, from Royal Victoria Hospital, Netley. Staff Nurses: Miss M. Barton, to Egypt, from Military Hospital, Devonport; Miss E. C. Ellis, to Egypt, from Cambridge Hospital, Aldershot; Miss C. G. Lees, to Military Hospital, Cairo, Egypt, from Military Hospital, Alexandria; Miss E. K. Kaberry, to Military Hospital, Alexandria, from Military Hospital, Cairo; Miss M. A. W. Green, to the Queen Alexandra Military Hospital, Millbank, London, on appointment; Miss E. V. Forrest, to Royal Herbert Hospital, Woolwich, on appointment.

*Appointments Confirmed.*—Staff Nurses: Miss A. Lee, Miss K. Lowe, Miss G. Hughes, Miss A. R. Hyslop, Miss A. E. M. Steen, Miss E. A. Williams.

### ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Major Henry C. Lamport to be Surgeon-Lieutenant-Colonel, dated July 13, 1908.

Surgeon-Lieutenant Hubert R. R. Fowler to be Surgeon-Captain, dated July 14, 1908.

### ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

*1st Gloucestershire (Royal Engineer Volunteers)*, Surgeon-Lieutenant Charles E. Lansdown resigns his commission, dated March 31, 1908.

*2nd Volunteer Battalion, The Queen's (Royal West Surrey) Regiment.*—Surgeon-Captain Paget D. Minchin resigns his commission, dated March 31, 1908.

*3rd Volunteer Battalion, The Northumberlvnd Fusiliers.*—Surgeon-Captain William H. Vickery resigns his commission, dated March 31, 1908.

*3rd Volunteer Battalion, The Lincolnshire Regiment.*—Surgeon-Captain John Bruce, M.B., resigns his commission, dated March 31, 1908.

*1st Volunteer Battalion, The Leicestershire Regiment.*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Robert R. Smith resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*2nd Volunteer Battalion, The South Staffordshire Regiment.*—Surgeon-Lieutenant Thomas Hutchinson resigns his commission, dated April 1, 1908.

*1st Volunteer Battalion, The Sherwood Foresters (Nottinghamshire and Derbyshire Regiment).*—Surgeon-Captain Ernest V. Eames resigns his commission, dated March 31, 1908.

*24th Middlesex Volunteer Rifle Corps.*—Surgeon-Lieutenant WyndhamA. Milli gan resigns his commission, dated March 30, 1908.

## EXAMINATIONS.

THE following results of examinations are notified for general information:—

Passed in Military Law for the rank of Lieutenant-Colonel: Majors F. W. Hardy, M.B., H. W. H. O'Reilly, M.B., J. H. Campbell, D.S.O. (75 per cent.).

Passed in Technical Subjects for the rank of Lieutenant-Colonel: Majors C. E. Pollock, A. E. C. Keble.

Passed in (*h*) *i* for rank of Captain: A. E. F. Hastings.

Passed in (*h*) *ii* and *iii* for the rank of Captain: R. P. Lewis, G. H. Rees, M.B., P. Farrant, C. J. Wyatt, M.B., H. E. Priestley, A. S. Littlejohns (80 per cent.), M. G. Dill, M.B., J. B. G. Mulligan (80 per cent.), T. C. C. Leslie, W. H. Forsyth, M.B., R. W. D. Leslie (80 per cent.).

Passed in (*h*) *ii* A. A. Sutcliff, M.B., C. F. White, M.B., G. W. W. Ware, M.B.

Passed in (*h*) *iii* W. J. Weston, A. G. Cummins, M.B., H. E. Goteloe.

Passed in (*d*) *ii* for the rank of Captain: R. P. Lewis (75 per cent.), G. H. Rees, M.B. (75 per cent.), W. J. Weston, C. J. Wyatt, M.B., F. C. Sampson, M.B., H. E. Priestley, P. J. Marett, A. A. Sutcliff, M.B., A. G. Cummins, M.B., H. E. Gotelee, A. S. Littlejohns (75 per cent.) §, M. G. Dill, M.B., T. C. C. Leslie (75 per cent.), W. H. Forsyth, M.B., R. W. D. Leslie.

The following officer was awarded a SPECIAL CERTIFICATE: A. S. Littlejohns.

# ROYAL ARMY MEDICAL COLLEGE.

## EXAMINATION OF CAPTAINS FOR PROMOTION TO MAJOR.

*List of Subjects for Essays.* Friday, July 24, 1908. Commencing 10 a.m. (Time allowed—three hours.) [N.B.—One subject only to be selected.]

(1) State the more important changes in the *fundus oculi* which may be seen in the cases of medical disease, and discuss their diagnostic significance.

(2) Discuss the pathology and treatment of uræmia.

(3) Discuss the differential diagnosis of glandular swellings, and describe the condition of the blood, as regards the number of red and white cells and the differential count, in lymphatic leukæmia and Hodgkin's disease respectively. What treatment would you advise in Hodgkin's disease?

(4) Discuss the causes and treatment of hæmoptysis.

(5) Discuss the differential diagnosis of acute (miliary) tuberculosis.

### *Surgical Essays.*

(1) The treatment of tubercular disease of the bladder.

(2) The pathology, diagnosis and treatment of intracranial lesions consequent upon disease of the middle ear.

(3) Diabetes; its pathology and bearing upon surgical procedure.

(4) Acute obstruction of the large bowel; its causation, differential diagnosis and treatment.

(5) The pathology and treatment of "perforating ulcer of the foot."

(6) Therapeutic inoculation; its rationale and details of practice.

*Medicine.* Friday, July 24, 1908. Commencing at 2.30 p.m. (Time allowed three hours.)

(1) Mention the affections of the cerebro-spinal system which may occur as a late result of syphilis; describe the lesions present in each, and discuss their pathology.

(2) Describe the mode of action of the cardiac tonics in common use, and discuss their suitability in the various valvular and myocardial affections for which they may be required.

(3) Discuss the prognosis in diabetes mellitus. What conditions often precede a fatal termination, and what treatment would you adopt should they arise?

(4) Describe the symptoms and course of varicella, and discuss fully the differential diagnosis.

(5) What constituents of the blood are believed to be concerned in the production of immunity, and what views are held as to their mode of action?

(6) Under what circumstances does hæmorrhagic infarction of the lung occur? Describe the morbid appearances and discuss the pathology of the condition.

*Surgery.* (Written.) Saturday, July 25, 1908. From 10 a.m. to 1 p.m. [N.B.—The last two questions, 5 and 6, are to be answered in a separate book from that in which the other questions are answered.]

(1) Describe the common sites of fracture of the femur, exclusive of those of the neck; and give the appropriate treatment for each, stating the grounds for its adoption.

(2) What symptoms may be produced by the impaction of a calculus in the cystic duct? How would you treat this condition?

(3) Describe the manner of causation, and give the symptoms, diagnosis and treatment, of ruptured urethra.

(4) Give the symptoms, diagnosis and treatment of suppuration in the maxillary antrum. With what other conditions may it be associated?

(5) Describe the various forms of gunshot injury to the shoulder-joint, and discuss fully the treatment of each.

(6) Discuss the treatment of gunshot wounds of the cranium, and of their principal complications.

*Refraction and Skiagraphy.* (Written.) (As part of the Examination in Surgery.) Monday, July 27, 1908. From 10 a.m. to 12 noon.

(1) Describe fully how you would take a skiagram of the kidney region in a case of suspected renal calculus.

What are the chief difficulties in obtaining a trustworthy skiagram of this region, and how are they to be overcome?

(2) Describe the method of using the fluorescent screen.

For what purposes is the fluorescent screen chiefly useful, and how far can the evidence obtained from its use be relied on?

(3) Mention the important points in the use and care of accumulators.

(4) A soldier complains that he "cannot see the target." How would you determine: (*a*) Whether his statement is true or false? (*b*) The nature of his visual defect, if any?

(5) Give a short account of presbyopia, including its causation, symptoms, and treatment.

## EXAMINATION FOR ADMISSION TO THE ROYAL ARMY MEDICAL CORPS.

*Medicine.* Case for commentary. Wednesday, July 29, 1908. Commencing 10 a.m. (Time allowed—one and a half hours.) Read your instructions.

A male, aged 55, admitted into hospital complaining of continuous occipital headache and pains in the legs. His father and two of his brothers had had gout. He had always had good health, but for the last twenty years had taken a good deal of alcohol. There was no history of syphilis. Two months before admission into hospital he began to suffer from headaches and lassitude, and was unable to attend to his work. The headaches persisted in spite of treatment. At this time his eyesight began to fail, and a month before admission he had a fit, during which he bit his tongue. He was unconscious for about twenty minutes. On admission he was found to be well nourished, his face was red, and his facial muscles twitched. Tongue was dirty, breath offensive, no appetite. Temperature normal. Pulse regular, slow, tension high, artery thickened. Heart and lung sounds normal. Pupils unequal, but reacted to light and to accommodation. Knee-jerks slightly increased. Urine acid, sp. gr. 1012, a little albumin, and a trace of sugar. The patient answered questions very slowly, and speech was hesitating. During the first week in hospital the patient improved, but later he began to vomit after his food, and at night became restless. Ten days after admission he passed into a sub-conscious condition, the temperature became sub-normal, the head was retracted, and the abdomen sunken. In two days more he was semi-comatose, and passed everything under him. This state lasted for three days, when the respirations became irregular, the temperature dropped to 96° F., and he died.

Discuss fully the differential diagnosis and give the treatment. What *post-mortem* appearances would you expect in the contents of the cranium, thorax, and abdomen?

*Surgery.* Case for commentary. Wednesday, July 29, 1908. Commencing 11.30 a.m. (Time allowed, 1½ hours.) Read your instructions.

Anamnesis: A male, aged 61, had suffered for some three years from occasional attacks of slight irritability of the bladder, following upon active bodily exertion, such as walking, cycling, or driving. These attacks, which were mainly nocturnal, compelled him to rise and micturate every half-hour or thereabouts, but passed off in a day or two. His urine was repeatedly tested, but showed no abnormality to physical, chemical, or microscopic examination, either during or after the attacks. The testes and prostate were normal. Cystoscopy revealed nothing. He had occasional slight aching in the lumbar region, but not simultaneously with the attacks of bladder irritability. He had never shown any signs of gout, nor were any crystals detected by the numerous analyses made of his urine. Nothing further regarding his history could be elicited to throw any light upon his case.

History of illness: In April, 1908, he had to travel for a fortnight, in carriages, railways and motor cars, often for 60 or 70 miles daily, and frequently over very hilly and rough mountain roads. During that time his bladder irritability was very marked, and he stated that his urine was often "high coloured" during the nights and in the mornings. He returned to the quiet of his own home, but the symptoms persisted and increased, so that he called in his medical attendant and was carefully examined by him.

Status præsens: His general condition was perfect. His heart, lungs, and digestive organs were normal. He neither was weak, nor had he lost flesh or weight. His appetite was good.

His temperature, however, was about 102° F. at nights and 90° F. in the mornings; but during ten days rest in bed it gradually fell to about 98·4° F. in the evenings, and to 97·9° F. in the mornings. The prostate and testes were again found to be normal. Abdominal palpation revealed a fulness in the right renal region of the size of a lemon; it was tender on pressure, and was, the patient now for the first time noticed, the seat of occasional, by no means severe, colic-like pains, which recalled to his mind the backaches he was accustomed to experience. The swelling in the kidney region was oval and smooth; when its mobility was tested, it exhibited merely the descent normal to the kidney during deep inspirations. When firm pressure was made upon the tumour it caused discomfort in the bladder and a desire to pass urine.

His urine was of a clear and uniformly pink colour, like port wine very much diluted with water. Red blood cells were numerous in its centrifuged deposit, as were also pear-shaped epithelial cells and large phagocyte cells. The sediment contained also numerous leucocytes, but no crystals or casts, and the mucus deposited was not greater than normal. The specific gravity was normal. It contained a moderate amount of albumin, but no glucose. Cystoscopy showed the papilla of the left ureter to be normal, but the right papilla was reddened, and the urine escaping from it had a pinkish tinge. In every other respect the patient was found to be perfectly healthy. Repeated skiagrams of the renal region were taken: the twelfth rib, the transverse processes of the vertebræ, and the iliac crest were clear and distinct, but there was no shadow in the situations of the kidney or ureter.

Treatment and its result: Recumbency, diet, and large fomentations gave little relief. Urotropine caused no improvement, but helmitol gave him marked relief. Minute hypodermic injections of morphia at once removed all discomfort; and, along with the helmitol, rest, and large abdominal fomentations, constituted the chief treatment. Under this he steadily improved, and his symptoms, coincidentally with the gradual fall of temperature, lessened and disappeared.

As the symptoms passed off the urine voided was found to contain shreds of brownish fibrin, at first in abundance, and then in lessening quantity and size. The renal tumour slowly diminished and completely disappeared. The urine ceased to contain albumin or other abnormal constituent.

Since the beginning of June the patient has been quite well and has experienced no relapse, although he has had to undergo much ordinary travelling by rail, carriage, and cycle.

# SPECIMEN QUESTIONS FOR THE EXAMINATION OF N.C.O.'s AND MEN FOR PROMOTION, PUBLISHED FOR GENERAL INFORMATION.

## QUARTERMASTER-SERJEANTS.

285 b. 1.

(1) How may a company moving in fours form forward into company column?

(2) State the position of the following with the company in line: company commander, half company commander, section commander, squad commander.

(3) A company column is moving to the right in fours approaching a bridge. Write down the words of command necessary to order the company over the bridge in column of fours, and describe in detail what happens.

(4) State what is required to equip an ordinary goods railway waggon for reception of lying down cases in Zavodovski's plan.

(5) Give the methods of loading and unloading stretchers with three bearers.

(6) Describe the regulation stretcher.

(7) What do you understand by a "Bearer Division"? What is the normal distribution of a Field Ambulance?

(8) Give a short description of a Field Ambulance.

285 b. 2.

(1) State the duties of a wardmaster in a hospital where there is no quartermaster, as regards charge of valuables belonging to patients.

(2) Answer briefly what are the regulations regarding a serjeants' mess as to the following: Membership, subscriptions, mess meetings, entertainments.

(3) Describe the duties of a steward in taking in and exchanging bedding, clothing and personal equipment. What steps should be taken if an equal number of clean articles cannot be given in exchange for those soiled.

(4) What latrine accommodation should be provided for troops in camp? What points must be considered in selecting the site for such latrine, and how may it be kept in a sanitary condition?

(5) What are the duties of a serjeant-major when a man deserts?

(6) What Army Forms are used in connection with diets and extras, and by whom are they prepared?

(7) How are the arms and equipment of wounded carried off the field? Where are they stored? What documents are required to accompany them if returned to store?

(8) What are the points of difference between a Field Ambulance and a Cavalry Field Ambulance?

285 b. 3.

(1) A serjeant elects to draw compensation for a tunic; six months from the date compensation is credited he is issued with one on re-payment. Upon whom does the cost of chevrons and Geneva Cross fall, and on what voucher are they issued?

(2) What are the duties of a quartermaster with regard to the care of unissued articles of clothing and necessaries?

(3) What are the regulations with regard to articles of public clothing issued to a soldier which are lost or wilfully made away with, or prematurely worn out through carelessness or neglect?

(4) What issues of clothing would be made to a man who arrived in South Africa after January 1, 1907?

(5) Mention the general instructions laid down in Appendix 12 Clothing Regulations for the storage, inspection and turnover of Reservists' mobilisation clothing and necessaries.

(6) How is camp equipment obtained when required for temporary use at home, and how is it accounted for?

(7) The general clothing ledger is divided into five sections, name them and state how receipts and issues are posted under the various sections.

(8) Where is the authority given for the issue of bugles to a Field Ambulance on mobilisation?

285 b. 4.

(1) How are supplies of medicine and surgical materials obtained, and how are they accounted for: (*a*) Home stations; (*b*) Abroad?

(2) What are the regulations regarding local purchases of medicine, &c., and how are payments made?

(3) Give the procedure on change of officers in charge of General Medical Stores.

(4) What are the rules laid down regarding medicines from different firms. How should they be kept?

(5) What articles of medical and surgical equipment are usually put on board ship carrying troops? What becomes of this equipment at the conclusion of the voyage?

(6) What are the regulations relating to checking the medical store ledger, and on what occasions is this done?

(7) What is meant by "loan equipment," and how is it accounted for?

(8) How is money dealt with which has been recovered in respect to losses, damages or deficiencies of medical and surgical equipment?

## STAFF-SERJEANTS.

284 b. 1.

(1) What is the procedure when a soldier wishes to change his name? Give a list of the documents which are attached to the original and duplicate attestations respectively.

(2) What are the conditions governing transfer to the Army Reserve on conversion of Army service abroad?

(3) When is service forfeited and when can it be restored?

(4) What do you mean by (1) extension of service (R.A.M.C.); (2) re-engagement? What conditions must be fulfilled (*a*) by a warrant officer, (*b*) a corporal?

(5) What is the procedure for comparison of the original and duplicate attestations of a man of the Royal Army Medical Corps on his discharge at home?

(*a*) On termination of first period of engagement.
(*b*) As medically unfit.
(*c*) Otherwise discharged.

284 b. 2.

(1) What procedure is adopted when a man wishes to remit money to the Post Office Savings Bank, England, through his accounts?

(2) How is the first charge for the corps pay of the first-class orderly made and supported?

(3) Under what circumstances does a soldier forfeit his pay?

(4) What is meant by miscellaneous allowance? (*b*) What is the amount allowed for a company of the Royal Army Medical Corps, and how is it drawn?

(5) State what is meant by (*a*) an allotment, (*b*) separation allowance, (*c*) compulsory stoppage, and how is each case claimed?

### SERJEANTS.

283 b. 1.

(1) Define the following: Alignment, company column, depth, interval.

(2) Give the orders and detail for the side step and mention the number of paces for which this movement can usually be employed.

(3) What are the rules and instructions for dressing when halted?

(4) How will the command "Change direction, right," be carried out on the march?

283 b. 2.

(1) Give the words of command and detail for (*a*) lifting a wounded man on to a stretcher; (*b*) lifting a loaded stretcher.

(2) Give the detail for "fix slings."

(3) Wounded have been placed on the stretcher. Give the words of command required to convey them and place them inside the ambulance waggons.

(4) Give dimensions, weight and tonnage of ambulance stretcher, Mark 1.

283 b. 3.

(1) What should the commander of a guard do when he receives the "crime" of a soldier in arrest?

(2) What are the orders with regard to a defaulter being allowed in the canteen?

(3) What are the regulations with regard to the saluting of officers: (*a*) When a soldier riding a bicycle passes an officer; (*b*) when two or more soldiers are together and an officer passes them?

(4) A soldier in your company informs you as his *Staff-Serjeant* that he wishes to make a complaint. How would you proceed?

283 b. 4.

(1) What are the duties of the commander of the guard in relation to Government property, stores, &c., on his charge?

(2) What are the duties of the serjeant in charge of a town picquet?

(3) Write out a duty roster for twelve men living in the barrack-room of which you have charge.

(4) What duties would you carry out as orderly serjeant of a company?

283 b. 5.

(1) As senior N.C.O. in a tent, what will you see carried out to keep the tent sanitary and generally comfortable?

(2) What precautions would you warn a recruit to take with regard to his water-bottle and drinking?

(3) What precautions are taken in camp to keep latrines sanitary?

(4) You are the senior N.C.O. in camp with a batch of recruits. State what you would tell them to do in order to maintain tidiness and cleanliness inside and outside the tent. What further warnings would you give them with a view to preventing insanitary conditions arising?

283 b. 6.

(1) What are the duties of steward in connection with the quality of the supplies?

(2) In a lunatic hospital, what is to be done in the case of a patient becoming violent?

(3) In a hospital where there is no quartermaster, what is the duty of steward when bedding brought to him for exchange appears to have been damaged by neglect?

(4) What are the orders to dispensers with reference to prescriptions received from out-patients?

CORPORALS.

280 e. 1.

(1) On what occasions do warrant and N.C.O.'s salute with the right hand?

(2) What are the regulations with regard to soldiers taking part in any meetings, demonstrations, or processions, for party or political purposes?

(3) When will a soldier charged with drunkenness be brought before an officer for investigation of his case?

280 e. 2.

(1) How is the cleaning of a barrack-room floor carried out, and what precautions must be observed?

(2) How will the ventilation of barrack-rooms be carried out?

(3) What are the orders for N.C.O.'s in charge of barrack-rooms, as regards losses or damages that may occur in their rooms?

280 e. 3.

(1) If troops remain in camp more than three days, what sanitary measures would you adopt as to tents, bedding, floors, &c.?

(2) Mention some conditions on which the efficiency of men will depend on the march.

(3) What precautions should be taken to obtain the best possible water for troops in camps, and how can suspicious water be improved when no filters are available?

280 e. 4.

(1) What are the duties of a wardmaster as regards the distribution of spirits and malt liquors to the patients?

(2) What are the duties of a wardmaster in wards not nursed by sisters as to: (*a*) Serious cases; (*b*) meals; (*c*) emergency cases brought in?

(3) What are the duties of the wardmaster with regard to the equipment and bedding of a ward?

280 e. 5.

(1) Describe respectively how the following cases should be carried:—

(*a*) Transverse wound of abdomen.
(*b*) Punctured wound of abdomen.
(*c*) Vertical wound of abdomen.

(2) How would you carry a man with a wound on right side of chest, giving reasons for your method?

(3) A man has been crushed by a wheel of a waggon. On examination you find some ribs on the left side broken, and the patient is spitting up blood. What would you do, and how would you place the patient on the stretcher?

280 e. 6.

(1) What ways do you know of arresting bleeding from an artery in the palm of the hand?

(2) Describe Sylvester's method of artificial respiration.

(3) Give the different methods of producing vomiting and give the ordinary emetics in use, also state those cases of poisoning in which emetics should not be given.

280 e. 7.

(1) In what way does a fire assist in ventilation, and where are ventilators which act as outlets usually placed in a room, and why?

(2) What steps would you take to ventilate a small ward containing one enteric patient during frosty weather?

(3) What cubic space should be allowed for each patient in hospital?

280 e. 8.

(1) Describe and give the use of each of the following instruments: Stethoscope, hernia bistoury, catheter, director, Spencer Wells' forceps, aneurysm needle, trephine.

(2) Give a brief description of the surgical haversack (not its contents), stating its weight and the way it is carried in the field.

(3) Mention the bottles, and their contents (medicines), contained in the "Field Medical Companion."

# THE ARMY AND NAVY MALE NURSES' CO-OPERATION.

47b, Welbeck Street, London, W.

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## First Annual Report, 1907-8.

The First Annual General Meeting of the Army and Navy Male Nurses' Co-operation was held at 47B, Welbeck Street, on July 31, 1908, Sir Frederick Treves, Bart., in the chair. The following report of the Executive Committee was received:—

The Committee has much pleasure in placing before the public the first report issued by the Army and Navy Male Nurses' Co-operation, dealing with the work accomplished during the year. This has proved most satisfactory, and has more than justified the expectations of those who have so generously supported the scheme. The word "year" is somewhat misleading. Although Her Majesty the Queen honoured the Society with her patronage in June, 1907, at the inaugural meeting, there were many preliminaries to be gone through before suitable offices could be found, nurses enrolled, and the medical profession notified that such an institution was starting. Therefore it was not until the end of October that the office was opened and nurses were supplied to the public.

The existence of the Co-operation has entirely depended on donations and subscriptions and the small commission of 10 per cent. deducted from the nurses' fees. Although there is every intention and expectation on the part of the Committee to ultimately make the Co-operation self-supporting, it is impossible to hope for this until it has been placed on a sound financial basis. The expenses of the offices and advertising cannot be met at present out of the commission of 10 per cent. on the earnings of the thirty nurses now enrolled on the register, notwithstanding the fact that they have been kept constantly in work, and the applications for nurses are increasing daily. The Committee must therefore look a little longer to the generosity of the public to help them in their endeavour to build up a Society which in a very short time will be free from all claims on charity. At least 150 nurses must be in constant employment before the office expenses can be met by the percentage taken from the nurses' earnings, Advertising also is essential for the success of the scheme; the medical profession and the laity have constantly to be reminded that it is from the Army and Navy alone that they must look for male nurses who have received a full general training.

Funds, however, are not only needed to defray these expenses, but for a *Residential Home*, and a small flat has been taken to lodge nurses who are next on the list to be dispatched to their cases. This requirement is essential in the interests of the patients served and for the securing of prompt response to all applications. Not only will this Home serve as a benefit to the employer, but to the employed; for the nurses will be able to have clean and comfortable bedrooms and the use of a bathroom, which would be impossible for them to obtain in the poor lodging houses of London. A small charge per night will be made to cover the working expenses. Part of the initial outlay of equipping the Home has been defrayed from the sum raised by "The People's Bargain Sale," held on May 22 and 23, and graciously opened by Her Royal Highness Princess Henry of Battenberg.

Through the kindness of the Press, the objects of the Co-operation have been adequately set forth. The Service papers are unanimous in recognising the utility of the scheme, and asking the public to give it their loyal support. The system of male nursing in England at this moment is inefficient and imperfectly organised, but this Association is doing much to improve it by keeping together a class of men who have already been trained for a valuable calling. On leaving the Service these men should be able to demand a market price for their skilled labour.

The South African War will soon have its veterans, and we shall have to ask ourselves what we have done for the men who worked unceasingly and without recognition in the Army Hospitals. To-day such men are in the prime of manhood, and if encouragement be not offered to them by the public, there can be but little wonder if they sink into despair.

That the men appreciate the efforts made on their behalf is amplified by the fact that over 150 have applied for employment within the last six months. Many of the applications that have reached the Office are from men who are still in the Services, all of excellent character, and with full nursing certificates. Can it be possible that the public will allow such men to know that the Co-operation had to abandon its kindly object owing to lack of national interest? The sum of £2,000 would silence the cry of impecuniosity.

The word charity should never be applied to any institution which furthers the welfare of our fighting men. The nation is under the deepest obligation to the Army and Navy, which obligation will be to some extent discharged by the generous support of any practical schemes that assist the soldier or sailor after he leaves the Service.

The Executive Committee have to announce, with much regret, that Sir Frederick Treves has found himself obliged to retire from the duties of Chairman owing to the pressure of other engagements. It is with satisfaction that they would propose him to the Annual General Meeting as President of the Army and Navy Male Nurses' Co-operation.

The Committee wish to place on record their appreciation of Miss McCaul's services in the cause of the Co-operation. The Co operation owes its very existence to Miss McCaul, and the measure of success it has already attained is due to her fostering care and close daily personal attendance. It is comparatively easy for a Committee to meet from time to time to frame rules and make suggestions, but the real onus of carrying them out falls on one person, and that person is Miss McCaul, to whom the Committee now tender their heartfelt gratitude.

The thanks of the Committee are also due to Dr. Hartley, not only as Honorary Treasurer, but also for the devoted, unobtrusive assistance he has given in the furtherance of the interests of the Co-operation.

In conclusion, the Committee desire to offer their sincere thanks for the kindly responses already received from numerous donors. The Hon. Solicitor and Auditor are also asked to accept an assurance of warm appreciation for the services they have rendered in connection with the official organisation of the Army and Navy Male Nurses' Co-operation.

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## ANNUAL DINNER CLUB OF THE WARRANT OFFICERS AND SERJEANTS, ROYAL ARMY MEDICAL CORPS.

It having occurred to many warrant officers, quartermaster- and staff-serjeants, serjeants and lance-serjeants of the Corps, both past and present, that a reunion in the form of an annual dinner should take place, a meeting was arranged of which the following are the minutes:—

A proposal to form a Committee for the purpose of holding an annual reunion at dinner of the various ranks of serjeants, past and present, of the Corps was discussed at a meeting of warrant officers and N.C.O.'s from various stations, &c., as below, held in the Serjeants' Mess, Millbank Barracks, London, on June 27:—

War Office Staff, Royal Army Medical Corps, London, S.W.
Depôt, Royal Army Medical Corps, Aldershot.
No. 1 Company, Royal Army Medical Corps, Aldershot.
No. 2 Company, Royal Army Medical Corps, Aldershot.
No. 3 Company, Royal Army Medical Corps, Aldershot.
Nos. 4, 5 and 21 Companies, Royal Army Medical Corps, Netley.
No. 9 Company, Royal Army Medical Corps, Colchester.
No. 10 Company, Royal Army Medical Corps, Chatham.
Nos. 12 and 34 Companies, Royal Army Medical Corps, Woolwich.
No. 18 Company, Royal Army Medical Corps, London.
No. 20 Company, Royal Army Medical Corps, Tidworth.

Permanent Staff Territorial Force.
Pensioners.
Serjeant-Major E. V. Saunders in the Chair.

Letters were received and read from various stations promising support. The Chairman stated the object of the meeting was to ascertain whether it was desirable to hold an annual dinner for the warrant officers, quartermaster- and staff-serjeants, serjeants and lance-serjeants, Royal Army Medical Corps, past and present, and if so, to discuss the matter.

Proposed by Staff-Serjeant E. J. Harris, and seconded by Quartermaster-Serjeant W. Woolley, that "In the opinion of this meeting the warrant officers and N.C.O.'s, past and present, above the rank of corporal, meet annually at a dinner, to be held in London on a date to be afterwards fixed, and that the Director-General, Army Medical Service, be asked to sanction such a gathering."
Carried unanimously.

Proposed by Serjeant-Major C. H. Smith, and seconded by Quartermaster-Serjeant C. A. Figg, that (*a*) "A Club be formed, called the 'Royal Army Medical Corps Warrant Officers, Quartermaster- and Staff-Serjeants, Serjeants and Lance-Serjeants, Past and Present, Annual Dinnèr Club.' (*b*) The entrance fee be 1s., and the annual subscription 1s. (*c*) All past members be asked to join. (*d*) The Director-General, Army Medical Service, be asked to become the President."
Carried unanimously.

Proposed by Quartermaster-Serjeant W. Shannon, and seconded by Staff-Serjeant H. Porter, that "Serjeant-Major W. T. Spencer be elected Vice-President."
Carried unanimously.

Proposed by Quartermaster-Serjeant W. Woolley, and seconded by Serjeant F. Hughes, that "Staff-Serjeant E. J. Harris be Honorary Secretary."
Carried unanimously.

Proposed by Staff-Serjeant H. Porter, and seconded by Quartermaster-Serjeant J. L. Driver, that "The Company Officer, No. 18 Company, Royal Army Medical Corps, and the Senior Warrant Officer at Millbank, be asked to act as Treasurers."
Carried unanimously.

The following were elected to serve on the Committee:—

Quartermaster-Serjeant C. A. Figg, Depôt, Aldershot.
Quartermaster-Serjeant T. J. Tillbrook, Royal Army Medical College, Millbank, London, S.W.
Quartermaster-Serjeant W. Wilson, Royal Herbert Hospital, Woolwich.
Quartermaster-Serjeant E. H. Senior, Headquarters, Eastern Command, London, S.W.
Staff-Serjeant J. J. B. Rampton, Territorial Force, London, W.C.
Mr. H. Porter, 12, Cotford Road, Thornton Heath.

The meeting closed after a vote of thanks to Serjeant-Major E. V. Saunders and Staff-Serjeant E. J. Harris for bringing the proposal forward.

The report of this meeting was in due course submitted to the Director-General, Army Medical Service, who sanctioned the gathering, and was good enough to signify his pleasure in becoming the first President of the Club.

In order to make this annual reunion a success, it is hoped that all warrant officers, quartermaster- and staff-serjeants, serjeants and lance-serjeants, will, whether serving at home or abroad, become members of the Club; and any N.C.O. of the above ranks wishing to become such member should communicate with the Hon. Secretary, Staff-Serjeant E. J. Harris, R.A.M.C., the Old Palace, Maidstone.

The Committee of the Club is composed of the following officers:—

*President.* — Surgeon-General Sir A. Keogh, K.C.B., M.D., K.H.P., Director-General, Army Medical Service.
*Vice-President.*—Serjeant-Major W. T. Spencer, R.A.M.C.
*Hon. Secretary.*—Staff-Serjeant E. J. Harris, R.A.M.C.
*Hon. Treasurers.*—Major H. S. Thurston, No. 18 Company, Royal Army Medical Corps; Serjeant-Major C. H. Smith, No. 18 Company, Royal Army Medical Corps.
*Members.*—Quartermaster-Serjeant C. A. Figg, R.A.M.C.; Quartermaster-Serjeant T. J. Tillbrook, R.A.M.C.; Quartermaster-Serjeant W. Wilson, R.A.M.C.; Quartermaster-Serjeant E. H. Senior, R.A.M.C.; Staff-Serjeant J. J. B. Rampton, R.A.M.C.; Mr. H. Porter, Pensioner.

# OBITUARY NOTICE.

The death took place, suddenly, on the 5th inst., at the age of 73, at his residence, 17, Suffolk Street, Pall Mall, of Brigade-Surgeon Melville George Jones. Deceased, who was a prominent and popular member of the Junior United Service Club, had a very large circle of friends who deeply lament his death. The remains were cremated at Golders Green on Monday, June 10, and amongst those present were Mr. and Mrs. C. E. Haws, Sir Charles Cuff, Mrs. O. Ashworth, Major Shaen Carter, Mr. and Mrs. Melville Ashworth, Surgeon-General Sinclair, Colonel Hodson Hooke, Colonel Carey, Colonel Hickman, Colonel Watson, Dr. Lees, Dr. Colbourne, E. B. Dickson, Francis W. Brett, F. G. Bertram, Miss Gompertz, Mrs. De St. Croix, &c.

# APPOINTMENT.

The Lord Chancellor has, on the recommendation of the Duke of Abercorn, Lieutenant of the County, appointed Lieutenant-Colonel Falvey to the Magistracy for Donegal.

# BIRTHS.

ARCHER.—On August 16, at Wingfield, Cliftonville Road, Belfast, to Captain and Mrs. G. J. Stoney Archer, R.A.M.C., a son.

CUNNINGHAM.—On July 25, at Portland, the wife of Captain R. A. Cunningham, R.A.M.C., of a son.

POWELL.—On August 5, at 2, Connaught Road, Rodwell, Weymouth, the wife of Captain J. E. Powell, R.A.M.C., of a daughter.

WARING.—On July 28, at Alverstoke, Hants, the wife of Major A. H. Waring, R.A.M.C., of a son.

# MARRIAGE.

PERRY—WINGFIELD.—On June 30, at Holy Trinity Church, Sloane Street, by the Rev. William C. Emeris, Major J. C. Prittie Perry, R.A.M.C., second son of the late Samuel William Perry, of the Grange, Ballymena, and Mrs. Perry, 44, St. Stephen's Green, Dublin, and grandson of the late Rev. Henry Prittie Perry and Lady Katherine Perry, to Gwenllian Edith Emily, youngest daughter of the late Edward Rhys Wingfield, of Barrington Park, Gloucestershire, and Mrs. Wingfield, of Dale Lodge, Sunningdale.

# DEATHS.

ALEXANDER.—On August 11, 1908, at Portobello, N.B., Honorary Brigade-Surgeon William Alexander, M.D., retired, Army Medical Service, aged 68. He entered the Service October 2, 1865; was promoted Surgeon, Army Medical Department, March 1, 1873; Surgeon-Major, October 2, 1878; Surgeon-Lieutenant-Colonel, Army Medical Staff, October 2, 1885. Retired with honorary rank of Brigade-Surgeon, October 28, 1885. His war service was as follows: Egyptian Expedition, 1882, attached to 1st Battalion Royal West Kent Regiment. Medal; bronze star.

JONES.—On August 6, 1908, at Pall Mall, London, Honorary Brigade-Surgeon Melville George Jones, retired, Army Medical Department, aged 73. He entered the Service October 19, 1857; was promoted Surgeon, Army Medical Department, March 1, 1873; Surgeon-Major, April 8, 1873. Placed on half pay with the honorary rank of Brigade-Surgeon, March 20, 1880. His war service was as follows: Afghan War, 1878-80. Return March from Gandamak. Mentioned in despatches; medal.

McDOWELL.—On July 6, 1908, at Peshawar, India, Major Frederick McDowell, R.A.M.C., aged 43. He entered the Service July 28, 1891; was promoted Major, Royal Army Medical Corps, July 28, 1903. His war services were as follows: North West Frontier of India, 1897-8, Tochi; medal with clasp. Operations in Orange River Colony, May to November 29, 1900, including actions at Biddulphsberg and Wittebergen (July 1 to 29); operations in the Transvaal and Orange River Colony, November 30, 1900, to May 31, 1902. Queen's medal with 3 clasps; King's medal with 2 clasps.

# EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

Wanted by Lieutenant-Colonel, going abroad about January, 1909, an exchange with a Lieutenant-Colonel or Major whose tour of home service would last till January, 1910. N.A., India or Egypt could be arranged for. Reply, stating terms, to Lieutenant-Colonel C. W. S. Magrath, R.A.M.C., Hilsea, Hants. *Reply urgent.*

An Officer's Wife proceeding abroad this trooping season would be glad to hear of a little girl to educate with her own (aged seven) whom she is leaving at home. Her house is situated in a healthy part of Sussex. Full particulars given and desired. Address, "M. N. O.," c/o Sir Charles McGrigor, Bart., & Co., 25, Charles Street, St. James's Square, London, S.W.

In the event of Reprints or "Excerpts" of articles being required by the authors, notification of such must be sent when submitting the papers. Reprints and Excerpts may be obtained at the following rates, and additional copies at proportionate rates :—

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G. STREET & CO., Ltd., 8, Serle Street, London, W.C.
The back outside cover is not available for advertisements.

# Notices.

## EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professiona subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only, they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," Royal Army Medical College, Millbank, London, S.W.

Communications have been received from Captain G. E. F. Stammers, Colonel Lambkin, Major H. C. French, Captain L. W. Harrison, Captain K. Reed, Lieutenant-Colonel G. F. Poynder, Captain A. E. Hamerton, D.S.O., Lieutenant M. P. Leahy, Captain T. E. Powell, Captain T. McCarthy, Captain P. Davy, Captain G. T. Stoney Archer, Major Prittie Perry, Major F. W. J. Porter, D.S.O., Colonel W. Rainsford, Private J. C. Reynolds, Major J. Ritchie, Lieutenant-Colonel R. E. R. Morse, Lieutenant A. E. S. Irvine, Staff-Serjeant T. Connell.

The following periodicals have been received:—

*British: Lancet, The Hospital, British Medical Journal, Army and Navy Gazette, The Royal Engineers' Journal, The Military Surgeon, Public Health, The Red Cross and Ambulance News, Journal of the Royal Sanitary Institute, Journal of the Royal Army Temperance Association, Medical Press and Circular, On the March, The Medical Review, Guy's Hospital Gazette, The Journal of Tropical Medicine and Hygiene, St. Bartholomew's Hospital Journal, Proceedings of the Royal Society of Medicine, Journal of the Royal United Service Institution, The Transvaal Medical Journal, The Journal of Tropical Veterinary Science, The Indian Medical Gazette.*

*Foreign: Archives de l'Institut Pasteur de Tunis, Le Caducée, Archiv für Schiffs- und Tropen-Hygiene, Revista de Sanidad Militar, The Japanese Med. Journal, Der Militärärzt, Archives de Médecine et de Pharmacie Militaires, Archives de Médicine Navale, Revista de Sanidad Militar y La Medicina Militar Española, Annali di Medicina Navale, Annales d'Hygiène et de Médecine Coloniales, Russian Medical Journal, Disinfektion, Bulletin de l'Institut Pasteur, Giornale di Medicina Militare, Bulletin of the Johns Hopkins Hospital.*

## MANAGER'S NOTICES.

The Journal of the Royal Army Medical Corps is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

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# JOURNAL
OF THE
# ROYAL ARMY MEDICAL CORPS.

## Corps News.

### OCTOBER, 1908.

## ARMY MEDICAL SERVICE.—GAZETTE NOTIFICATIONS.

Major Edwin T. F. Birrell, M.B., Royal Army Medical Corps, to be a Deputy-Assistant-Director-General at Headquarters, *vice* Major H. C. Thurston, C.M.G., dated August 18, 1908.

Colonel John J. La Vettée de la Dubeterre Morris, M.D., retires on retired pay, dated September 9, 1908. He entered the Service February 4, 1877; was promoted Surgeon-Major February 4, 1889; Surgeon-Lieutenant-Colonel, Army Medical Staff, February 4, 1897; Lieutenant-Colonel, Royal Army Medical Corps, with higher rate of pay, October 17, 1898; Colonel, Royal Army Medical Corps, November 11, 1903. His war services are as follows: Afghan War, 1879-80, Battle of Charasiah, and the different affairs round Kabul in December, 1879, including the Defence of Sherpur, Expedition to Kohistan, and affair at Childukhtean. Despatches *London Gazette*, July 30, 1880. Medal with 2 clasps.

## ROYAL ARMY MEDICAL CORPS.

Captain William Byam is seconded for Service with the Egyptian Army, dated July 24, 1908.

Lieutenant Alan C. Vidal, from temporary half-pay, to be Lieutenant, with precedence next below Lieutenant M. J. Lochrin, dated August 10, 1908.

The undermentioned Officers of the Royal Army Medical Corps to be Adjutants of Schools of Instruction: Captains Richard Harte Lloyd, dated June 3, 1908; John Macfarlane Sloan, D.S.O., M.B., dated June 12, 1908; Edmund Bennett, Edward Patrick Connolly, Frederick Archer Stephens, William Archer Woodside, dated June 15, 1908; Horace Samson Roch, dated June 17, 1908.

Major Alexander O. C. Watson, M.B., retires on retired pay, dated September 5, 1908. He entered the Service February 5, 1887; was promoted Major, Royal Army Medical Corps, February 5, 1899.

Lieutenant George B. F. Churchill to be Captain, dated July 31, 1908.

The undermentioned Lieutenants to be Captains, dated July 31, 1908: Charles P. Thomson, M.D.; George W. Heron; Robert J. B. Buchanan; George S. Wallace, M.B.; William S. Nealor; Richard G. Meredith, M.B.; Frederick E. Roberts; Arthur A. McNeight, M.B.; Thomas A. Gibbon, M.D.; James E. Hoar; Ernest B. Booth, M.D.; Richard J. C. Thompson; Cecil D. M. Holbrooke; Ernest G. R. Lithgow; Pierce Power, M.B.; James S. Pascoe; Charles W. O'Brien; George G. Tabuteau; John M. B. Rahilly, M.B.; Richard E. Humfrey; William G. Maydon, M.B.; Garfield Ormrod, M.B.

**ARRIVALS HOME ON LEAVE.**—From India: Colonel H. R. Whitehead; Lieutenant-Colonels S. C. Philson, J. M. F. Shine; Major A. P. Blenkinsop; Captains L. Humphry, L. V. Thurston, M. M. Rattray (sick). From South Africa: Lieutenant W. McConaghy. From Malta: Lieutenant-Colonel J. J. Gerrard; Lieutenant P. J. Marett. From Gibraltar: Major C. E. P. Fowler,

**ARRIVALS HOME.**—Time expired: Lieutenant-Colonel H. M. Sloggett, from Malta.

**DIPLOMAS.**—Lieutenant-Colonel R. H. Penton obtained the Diploma in Public Health, London. Major W. J. Taylor obtained the Diploma in Public Health, Ireland. Captain R. A. Cunningham obtained the Diploma in Public Health, Glasgow. Major G. S. Crawford obtained the Diploma in Tropical Medicine, Liverpool. Captain S. L. Cummins obtained the Diploma in Tropical Medicine, Cambridge. Lieutenant C. Cassidy obtained degrees of M.A., M.B., and B.C., University of Cambridge.

**INCREASED PAY.**—Lieutenant-Colonel R. Kirkpatrick, C.M.G., has been selected for increased pay of that rank.

**POSTINGS.**—Lieutenant-Colonel F. S. Heuston, C.M.G., to Scottish Command; Lieutenant-Colonel H. M. Sloggett to Aldershot Command; Captain N. H. Ross to Aldershot Command; Captain F. Harvey to Southern Command.

**EMBARKATIONS.**—For India: Major S. W. Sweetnam, Lieutenants W. B. Purdon, G. F. Rudkin, E. M. Middleton, T. Casement, T. H. Scott, J. J. O'Keeffe, H. W. Farebrother, E. C. Phelan, A. C. Elliott, C. H. Denyer.

**APPOINTMENTS.**—Lieutenant-Colonel J. R. Dodd as Administrative Medical Officer at Cork; Lieutenant-Colonel M. W. Russell as Medical Inspector of Recruits, Eastern Command; Major G. S. McLoughlin, D.S.O., as Medical Inspector of Recruits, Western Command; Captain R. V. Cowey as Specialist in Midwifery at Tidworth; Captain W. Riach as Specialist in Ophthalmology at Portsmouth; Captain J. H. Robinson as Specialist in Midwifery at Fermoy; Captain E. P. Sewell as Specialist Sanitary Officer in Belfast; Captain F. Harvey as Specialist Sanitary Officer, Southern Command; Captain W. J. Tobin, Charge of Military Families Hospital, Curragh; Captain J. W. West as Specialist in Operative Surgery at Dublin.

**TRANSFERS.** — Lieutenant-Colonel M. W. Russell, from London Distrfct to Eastern Command; Major G. S. McLoughlin, D.S.O., from Eastern to Western Command; Captain E. P. Sewell, from Aldershot to Irish Command; Captain W. J. Tobin, from Northern to Irish Command.

**EXCHANGES.**—Lieutenant-Colonel H. T. Knaggs and Major F. J. Morgan; Lieutenant-Colonels C. W. S. Magrath and H. T. Knaggs; Captains H. F. Shea and E. V. Aylen.

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Notification has been received from India that the undernamed Officers have been posted to Divisions as shown, but it must be understood that the distribution is liable to alteration. Officers who desire to know the exact station to which they will be sent should communicate direct with Principal Medical Officers of Divisions.

1st Peshawar Division: Major J. C. Weir; Captain J. G. Gill.

2nd (Rawalpindi) Division: Lieutenant-Colonel H. J. Fletcher; Major M. P. C. Holt, D.S.O.; Captain B. Watts; Lieutenants A. C. Elliott, E. M. Middleton, F. H. Scott.

3rd (Lahore) Division: Lieutenant-Colonel E. Butt to command Station Hospital, Lahore Cantonment; Majors S. H. Withers, E. C. Anderson, D.S.O., A. G. Thompson, S. A. Archer; Captain B. F. Wingate; Lieutenants A. H. Heslop, D. M. Corbett, W. E. C. Lunn, W. W. Boyce, F. L. Bradish, C. H. Bowle, W. Mitchell, T. H. Scott, O. R. McEwen.

4th (Quetta) Division: Major E. W. Slayter; Captains W. P. Gwynn, J. Matthews, H. Herrick; Lieutenant J. J. O'Keeffe.

5th (Mhow) Division: Lieutenant-Colonel R. J. Geddes, D.S.O., to command Station Hospital, Jubbulpore; Majors C. W. R. Healey, M. Swabey, R. F. E. Austin, J. Girvin, E. W. Bliss; Captain J. H. Barbour; Lieutenants E. B. Lathbury, J. R. Foster, I. du P. Langrishe with 5th D.G., T. W. Browne.

6th (Poona) Division: Majors F. J. Wade Brown, S. W. Sweetnam; Captains H. M. Nicholls, H. K. Palmer; Lieutenants J. A. Bennett, H. L. Howell, O. C. P. Cooke, C. Scaife.

7th (Meerut) Division: Major H. I. Pocock; Captains J. D. G. Macpherson, L. E. L. Parker; Lieutenants A. C. Amy, J. L. Wood, D. Coutts, D. T. McCarthay.

8th (Lucknow) Division: Lieutenant-Colonels W. A. Morris, H. N. Thompson, D.S.O.; Majors R. J. Blackham, F. E. Gunter; Captain P. S. O'Reilly, W. R. Blackwell, A. H. Safford; Lieutenants W. F. Loughnan, W. I. Thompson, C. H. Denyer, E. C. Phelan, F. Casement, R. D. O'Connor.

9th (Secunderabad) Division: Lieutenant-Colonel S. Powell; Majors J. C. Connor, D. D. Shanahan, J. W. Bullen, C. W. H. Whitestone; Captains E. T. Inkson, V.C., E. F. Q. L'Estrange; Lieutenants E. D. Caddell, M. J. Lochrin, G. P. A. Bracken, C. Kelly, G. F. Rudkin, B. Johnson, H. W. Farebrother, M. O. Wilson.

Burma Division: Captain G. M. Goldsmith; Lieutenant W. B. Purdon.

*List of tour-expired Officers of the Royal Army Medical Corps in India detailed to embark for England in the several transports to which they have been allotted during the trooping season,* 1908-9 :—

1st Transport "Rohilla," October 2, 1908, from Karachi. (Leaves Aden, October 7, 1908.) Lieutenant-Colonel T. P. Woodhouse; Lieutenant-Colonel J. Fallon; Lieutenant-Colonel J. J. Russell; Captain D. O. Hyde; Captain F. S. Walker; Captain J. M. H. Conway; Captain R. Storrs.

2nd Transport "Dongola," October 16, 1908, from Bombay. Lieutenant-Colonel F. R. Newland; Major W. Tibbits; Major E. H. Condon; Captain F. A. H. Clarke; Captain R. J. Franklin.

3rd Transport "Plassy" (Hospital Ship), October 30, 1908, from Bombay. (Arrives Malta, November 13.) Lieutenant-Colonel F. W. C. Jones; Major R. J. A. Durant; Major C. W. Profeit; Captain A. H. Hayes; Captain W. W. Browne; Captain R. B. Ainsworth.

4th Transport "Rewa," November 13, 1908, from Karachi. Lieutenant-Colonel H. Carr; Major A. W. Hooper, D.S.O.; Major N. Tyacke; Captain S. B. Smith; Captain N. D. Walker; Captain N. E. J. Harding.

5th Transport "Rohilla," December 3, 1908, from Bombay. (Leaves Aden, December 8.) Lieutenant-Colonel M. J. Sexton; Major W. G. Beyts; Major W. T. Mould; Captain D. E. Curme; Captain C. H. Carr; Captain R. Rutherford; Captain G. A. K. H. Reid; Captain J. F. Martin.

6th Transport "Dongola," December 18, 1908, from Karachi. Lieutenant-Colonel J. Donaldson; Captain G. J. Houghton; Captain H. A. Davidson; Captain E. B. Knox; Captain C. A. J. A. Balck.

7th Transport "Plassy" (Hospital Ship), January 1, 1909, from Bombay. (Arrives Malta, January 15.) Lieutenant-Colonel T. G. Lavie; Major J. C. Morgan; Captain W. L. Steele; Captain J. McKenzie; Captain M. C. Beatty; Captain H. J. Crossley; Captain W. C. Croly.

8th Transport "Rewa," January 14, 1909, from Karachi. (Arrives Queenstown, February 2.) Lieutenant-Colonel R. E. R. Morse; Captain C. D. Myles; Captain D. Ahern; Captain H. T. Stack; Capt. C. H. J. Brown.

9th Transport "Rohilla," February 3, 1909, from Bombay. Lieutenant-Colonel J. J. C. Donnett; Major C. H. Hale, D.S.O.; Major F. W. Begbie; Captain W. F. Tyndale; Captain J. G. Bell; Captain R. H. Bridges.

10th Transport "Dongola," February 17, 1909, from Bombay. Lieutenant-Colonel F. H. Treherne; Major A. E. Milner; Captain J. A. W. Webster; Captain R. C. Wilmott; Captain H. B. Kelly; Captain E. M. Pennefather.

11th Transport "Plassy" (Hospital Ship), March 4, 1909, from Bombay. (Leaves Aden, March 9, 1909.) Lieutenant-Colonel A. S. Rose; Major F. R. Buswell; Captain T. S. Coates; Captain J. B. Meldon; Captain B. H. V. Dunbar; Captain J. C. G. Carmichael; Captain D. G. Carmichael; Captain D. L. Harding.

12th Transport "Rewa," March 17, 1909, from Karachi. Major W. Hallaran; Captain P. Davidson, D.S.O.; Captain J. M. M. Crawford; Captain A. E. B. Wood; Captain C. Bramhall.

# MEMORANDUM.

THE FOLLOWING LIST SHOWS THE POSITION OF OFFICERS ON THE ROSTER FOR SERVICE ABROAD.

Officers who have been nominated for service abroad during the coming season are excluded. Those holding appointments for fixed periods are indicated by the dates of expiry of the appointments.

*Selected Lieutenant-Colonels.*

Lieut.-Col. J. M. Irwin (1.6.10).
,, A. G. Kay (retiring Dec. 1908).
,, W. L. Reade (24.10.10).
Bt.-Col. and Lieut.-Col. F. J. Lambkin (2.4.10).
Lieut.-Col. F. A. B. Daly, C.B. (8.12.08).
,, W. G. Macpherson, C.M.G. (29.12.09).
,, R. D. Hodson.
,, W. Dick (3.2.11).
Lieut.-Col. R. Kirkpatrick, C.M.G. (1.9.11).
,, S. Townsend (1.4.09).
,, R. I. D. Hackett.
,, W. G. A. Bedford, C.M.G. (6.12.09).
,, C. E. Nichol, D.S.O. (5.11.10).
,, R. Porter.
,, W. Rowney (15.3.11).
,, H. Barratt (7.4.11).
,, E. L. Maunsell.

*Lieutenant-Colonels and Majors.*

Lieut.-Col. W. B. Leishman (31.1.09).
,, R. H. Firth (28.2.09).
,, R. J. S. Simpson (21.8.09).
Major C. G. Spencer (31.7.09).
,, W. S. Harrison (31.1.10).
Lieut.-Col. Sir J. Fayrer, Bt. (8.10.09).
,, C. R. Tyrrell (21.8.09).
,, R. Caldwell (2.8.09).
,, J. R. Yourdi.
,, H. E. Cree.
,, T. H. F. Clarkson (2.2.10).
,, T. W. O. H. Hamilton (2.4.10).
Major G. A. T. Bray (20.8.10).
,, J. Thomson (13.8.09).
,, G. B. Stanistreet (7.9.10).
Lieut.-Col. J. S. Davidson (6.5.09).
,, R. J. C. Cottell (16.8.11).
Major T. B. Beach (4.4.10).
,, G. A. Moore (23.12.09).
,, W. W. Beveridge, D.S.O. (17.6.10),
Lieut.-Col. R. H. Penton, D.S.O. (10.12.09).
,, J. D. Ferguson, D.S.O. (12.6.09).
,, E. G. Browne (30.9.10).
,, J. V. Salvage (11.10.09).
Major J. D. Alexander.
Lieut.-Col. A. Dodd.
,, J. H. Curtis.
,, A. T. 1 Lilly.
Major J. F. M. Kelly.
Lieut.-Col. S. E. Duncan.
,, C. E. Faunce.
,, C. H. Burtchaell (7.1.11).
,, R. P. Bond (4.1.11).
,, S. R. Wills.
Major G. W. Tate.
Lieut.-Col. R. J. Windle (30.9.10).
Major S. J. C. P. Perry.
Lieut.-Col. H. W. Austin.
Major H. C. French.
,, L. F. Smith (4.12.09).
,, A. J. Chambers.
Major W. A. Ward.
,, J. V. Forrest.
,, E. T. F. Birrell (18.8.12).
Lieut.-Col. C. W. S. Magrath.
,, C. Birt.
Major E. M. Hassard.
Lieut.-Col. C. W. Johnson.
Major M. P. Corkery.
Lieut.-Col. D. M. Saunders (28.1.10)
Major G. S. McLoughlin, D.S.O. (1.9.11).
,, H. W. Grattan.
,, J. H. Rivers.
Major J. H. E. Austin.
,, W. C. Poole.
Lieut.-Col. C. H. Melville (17.9 12).
Major H. A. Bray (1.2.11).
,, E. E. Powell.
Lieut.-Col. E. Eckersley (8.3.10).
Major E. W. W. Cochrane (5.11.09).
,, G. E. F. Stammers (12.4.10)
Lieut.-Col. G. G. Adams (29.8.09).
Major C. R. Elliott (19.10.09).
,, H. J. M. Buist, D.S.O. (30.4.10).
Lieut.-Col. A. A. Sutton, D.S.O. (21.1.10).
Major C. E. G. Stalkartt.
,, H. S. Thurston.
Lieut.-Col. J. B. W. Buchanan.
,, G. W. Brazier-Creagh.
,, R. W. Wright (14.3.10).
,, R. R. H. Moore (9.3.10).
,, R. H. Hall (15.2.09).
Major J. J. C. Watson, C.I.E.
,, A. H. Morris (9.7.10).
,, C. F. Wanhill (27.7.11).
,, S. H. Fairrie.
,, C. T. Samman.
,, J. Ritchie.
,, G. T. Rawnsley.
,, C. J. Healy.
Lieut.-Col. C. L. Josling (10.3.10).
,, C. S. Sparkes.
Major C. B. Martin.

Lieut.-Col. R. G. Hanley.
Major R. J. W. Mawhinny.
,, S. F. St. D. Green (24.10.10).
Lieut.-Col. S. G. Allen.
,, D. V. O'Connell.
Major L. Way.
,, R. C. Lewis.
Lieut.-Col. C. J. Macdonald.
,, W. Turner (17.12.10).
,, C. C. Reilly (7.12.10).
Major F. G. Faichnie.
,, F. M. Mangin (31.1.11).
Major H. E. Staddon.
Lieut.-Col. M. W. Russell.
,, A. E. Tate (31.3.12).
Major K. B. Barnett.
,, N. Marder.
Lieut.-Col. F. S. Heuston, C.M.G.
Major O. L. Robinson (20.4.11).
,, D. Lawson.
,, W. H. Horrocks (17.9.11).
,, B. H. Scott (1.5.11).
,, G. Dansey Browning.
Lieut.-Col. H. M. Sloggett,

*Captains.*

Captain J. M. Sloan (15.6.11).
,, J. Poe (1.8.09).
,, H. C. R. Hime (5.2.10).
,, R. H. Lloyd (15.6.11).
,, C. J. O'Gorman, D.S.O.
,, C. W. Mainprise (1.8.09).
,, H. S. Roch (15·6.11).
,, E. P. Connolly (15.6.11).
,, W. A. Woodside (15.6.11).
,, V. J. Crawford (25·10.10).
,, M. M. Lowsley (1.8.09).
,, A. M. MacLaughlin.
,, R. A. Cunningham.
,, W. J. P. Adye-Curran.
,, H. M. Morton.
,, A. F. Carlyon.
,, G. J. S. Archer.
,, E. W. Siberry.
,, J. H. R. Bond.
,, E. E. Ellery.
,, H. O. B. Browne-Mason.
,, F. Ashe (3.9.10).
,, H. L. W. Norrington (23.9.10).
,, G. G. Delap, D.S.O. (15.6.12).
,, J. W. Leake.
,, E. Bennett (15.6.11).
,, H. Simson.
,, O. W. A. Elsner,
,, F. A. Stephens (15.6.11).
,, E. G. Ford.
,, E. McDonnell.
,, James M. Buist.
,, H. B. G. Walton.
,, H. R. Bateman.
,, H. B. Fawcus.
,, E. P. Hewitt.
,, J. Tobin.
,, J. G. Churton.
,, T. C. Lauder.
,, A. L. A. Webb.
,, W. L. Bennett.
,, J. J. W. Prescott, D.S.O.
,, H. P. W. Barrow (12.10.10).
,, J. A. Hartigan (17.1.11).
,, G. H. Goddard.
,, F. J. Palmer.
,, A. D. Waring.
,, A. D. Jameson (20.8.10).
,, T. E. Fielding.
,, G. Carroll.
Captain C. E. Fleming.
,, F. M. Parry.
,, W. L. Baker.
,, B. R. Dennis.
,, H. G. F. Stallard (10.11.10).
,, F. MacLennan.
,, F. W. Cotton.
,, W. Bennett.
,, G. F. Sheehan.
,, F. W. Lambelle.
,, L. M. Purser.
,, H. F. Shea.
,, A. E. Hamerton, D.S.O.
,, J. M. Cuthbert.
,, J. W. West.
,, S. M. Adye-Curran.
,, A. W. A. Irwin.
,, A. E. Thorp.
,, C. H. Straton.
,, E. P. Sewell.
,, A. C. Adderley.
,, A. R. C. Parsons.
,, R. N. Woodley.
,, L. Wood.
,, J. Powell.
,, H. E. J. A. Howley.
,, J. G. Foster.
,, G. F. Rugg.
,, W. B. Winkfield.
,, W. B. Fry.
,, C. H. Furnivall.
,, R. L. Ronayne.
,, R. F. Ellery.
,, E. G. Ffrench.
,, G. S. C. Hayes.
,, R. L. Popham.
,, L. N. Lloyd, D.S.O. (1.11.11).
,, W. M. B. Sparkes.
,, A. W. N. Bowen.
,, W. Riach.
,, J. C. Kennedy.
,, T. J. Potter.
,, R. T. Brown (15.11.09).
,, J. H. Robinson.
,, J. T. Johnson.
,, R. V. Cowey.
,, R. N. Hunt.
,, W. M. McLoughlin.
,, P. H. Henderson.
,, F. S. Penny.

Captain J. Dorgan.
,, A. C. Duffey.
,, W. H. S. Nickerson, V.C.(1.10.10).
,, W. J. Waters.
,, A. H. Morris (9.7.10).
,, E. E. Parkes.
,, E. Brodribb (15.8.11).
,, A. W. Gibson.
,, C. R. Evans.
,, J. B. Clarke.
,, B. S. Bartlett.
,, D. J. F. O'Donoghue.
,, P. C. Douglass.
,, T. B. Unwin.
,, J. S. Bostock.
,, J. McD. McCarthy (28.12.10).
,, A. R. O'Flaherty.
,, A. R. Greenwood.
,, P. G. Hyde.
,, A. A. Seeds.
,, J. P. J. Murphy.
,, H. A. Bransbury.
,, R. C. Wilson.
,, A. H. McN. Mitchell.
,, J. Cowan.
,, G. Baillie.
,, B. B. Burke.
,, F. G. Fitzgerald.
,, H. B. Connell.
,, W. R. P. Goodwin (4.9.10).
,, R. M. Skinner.
,, T. Biggam.
,, R. F. M. Fawcett.
,, L. F. F. Winslow.
,, R. S. H. Fuhr, D.S.O.

Captain A. J. Williamson.
,, M. W. Falkner.
,, W. M. Power.
,, W. S. Crosthwait.
,, J. E. Hodgson.
,, E. Ryan.
,, H. J. McGrigor.
,, H. Rogers.
,, L. W. Harrison.
,, M. F. Foulds.
,, D. S. Skelton.
,, H. W. Long.
,, C. C. Cumming.
,, A. W. Sampey.
,, M. G. Winder.
,, L. L. G. Thorpe.
,, W. Davis.
,, F. E. Rowan Robinson.
,, J. L. Jones.
,, A. N. Fraser (31.8.11).
,, J. H. Duguid.
,, E. S. Worthington.
,, W. M. H. Spiller.
,, H. H. Kiddle.
,, N. H. Ross.
,, F. Harvey.
,, L. Cotterill.
,, A. McMunn.
,, J. H. R. Winder.
,, A. J. W. Wells.
,, J. F. Whelan.
,, T. F. Ritchie.
,, A. L. Scott.
,, W. J. S. Harvey.

**PROMOTION.**—8395 Quartermaster-Serjeant R. Stanley, to be Serjeant-Major, *vice* T. H. Williams, to pension, August, 16, 1908,

THE FOLLOWING N.C.O.'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Quartermaster-Serjeants.*—10573 Staff-Serjeant W. H. Chudleigh; 8268 Staff-Serjeant G. B. Walker, 7232 Staff-Serjeant E. Hunt.

*For Staff-Serjeant.*—12340 Serjeant T. Butler; 12519 Serjeant R. E. Alford.

*For Serjeants.*—16097 Corporal E. Bowen; 12357 Lance-Serjeant F. Molloy.

*For Corporals.*—11755 Private J. Paulizky; 16882 Private G. J. Short; 13035 G. V. Chandler; 12518 Private H. Gale; 1847 Private R. W. Ogg; 19350 Private C. J. W. Barnes; 18868 Private F. Skelly; 19427 Private C. E. Vidler; 86 Private W. Redfern; 17413 Private E. Tweed; 18318 Private E. G. Thomas; 19916 Private H. G. Carroll; 12947 Private M. Henderson; 835 Private D. H. Jonathan; 11064 Private F. Slattery; 189 Private G. A. Taylor; 19813 Private H. Phillips; 19409 Private A. Hutchinson; 70 Private J. Handford; 17997 Private D. Morgan; 19761 Private L. Whitworth; 208 Private B. J. Henry; 247 Private T. J. Doyle.

**LIST OF CASUALTIES:—**

*Discharges.*—5578 Serjeant-Major T. H. Williams, August 15, 1908, to pension; 6827 Quartermaster-Serjeant W. Woolley, August 31, 1908, termination of second period; 7881 Staff-Serjeant G. Fells, September 11, 1903, termination of second period; 7896 Serjeant N. B. Neilan, September 9, 1908, termination of second period; 7851 Corporal H. Malone, August 15, 1908, termination of second period; 11195 Private J. Harris, August 12, 1908, termination of first period; 6917 Private J. Whitehead, September 4, 1908, after three months' notice; 11242 Private G. West, September 3, 1908, termination of first period; 1728 Private F. G. Hufflett, September 3, 1908, medically unfit.

*Transferred to Army Reserve.*—1166 Private J. Selwood, August 12, 1908; 19748 Private D. H. Parr, August 15, 1908; 17547 Private G. E. Burton, August 15, 1908; 1167 Private R. Burchell, August 13, 1908; 1170 Private J. Richens, August 13, 1908; 1168 Private C. E. Maris, August 13, 1908; 1173 Private G. Stone, August 14, 1908; 19739 Private A. E. Down, August 13, 1908; 19741 Private J. Pearson, August 13, 1908; 1172 Private W. J. Hurrell, August 14, 1908; 1174 Private C. G. Weston, August 14, 1908; 19743 Private J. H. Pountney, August 13, 1908; 1176 Private G. Pearce, August 15, 1908; 14468 Private J. Morris, August 16, 1908; 14481 Private B. Fleckney, August 16, 1908; 14453 Lance-Corporal J. Hay, August 15, 1908; 1177 Private F. T. Vine, August 19, 1908; 1186 Private P. J. Garwood, August 22, 1908; 1182 Private F. E. Harmer, August 19, 1908; 1183 Private A. Gibbons, August 20, 1908; 19767 Private T. Monksfield, August 21, 1908; 19755 Private J. Woods, August 15, 1908; 1192 Private W. Davies, August 18, 1908; 19781 Private C. Sandfield, August 20, 1908; 1193 Private V. Hughes, August 23, 1908; 19778 Private S. H. Morris, August 25, 1908; 1205 Private F. J. Robinson, August 25, 1908; 1204 Private S. Waite, August 25, 1908; 1200 Private J. C. Gaunt, August 28, 1908; 1208 Private F. Stubbs, August 25, 1908; 19780 Private T. H. Pimlott, August 25, 1908; 1196 Private H. H. Kirk, August 26, 1908; 1199 Private F. Merison, August 28, 1908; 1207 Private W. O. P. Wilson, August 29, 1908; 19737 Private A. J. Burt, August 24, 1908; 1195 Private G. A. Dodd, August 26, 1908; 17543 Corporal F. A. Dawes, August 27, 1908; 19797 Private A. J. Hughes, August 28, 1908; 1201 Private C. S. V. Englefield, August 29, 1908; 1198 Private J. E. Bisshopp, August 28, 1908; 19803 Private A. T. Levy, August 28, 1908; 19786 Private J. D. Buchanan, August 23, 1908; 19794 Private T. A. F. Roy, August 27, 1908; 19796 Private E. Clarke, August 28, 1908; 19750 Private F. Crabb, August 16, 1908; 14510 Private F. Cooper, August 29, 1908; 1202 Private W. S. Hurst, August 30, 1908; 19807 Private E. J. Murphy, August 31, 1908; 17549 Private — Pepper, September 2, 1908; 1214 Private S. P. Rose, September 2, 1908; 19818 Private J. G. Deakin, September 4, 1908; 14527 Private R. Mollison, September 4, 1908; 1210 Private S. Watford, September 2, 1908; 1211 Private S. C. Martin, September 2, 1908; 1209 Private G. Davis, September 1, 1908; 1213 Private A Arnold, September 2, 1908; 1215 Private G. H. Hunt, September 3, 1908; 19819 Private A. J. C. Mansfield, September 4, 1908: 1220 Private R. V. McCreath, September 5, 1908; 14512 Corporal J. Widdall, September 2, 1908; 19811 Private W. E. W. Barron, September 3, 1908; 14526 Private H. Abrahart, September 4, 1908; 1208 Private G. Ashdown, September 1, 1908; 1218 Private J. W. Felton, September 3, 1908; 1219 Private M. McKenna, September 4, 1908; 19810 Private F. C. Cook, September 1, 1908; 19820 Private H. W. Staff, September 6, 1908.

*Transfers from other Corps.*—8395 Quartermaster-Serjeant R. Stanley, August 15, 1908, from Colonial Government; 1869, Private R. Brason, July 31, 1908, from King's Royal Rifles; 8137 Serjeant T. French, August 31, 1908, from R.A.M.C. Vols.; 11724 Serjeant J. M. Maxwell, September 1, 1908, from Transvaal Medical Corps; 10849 Serjeant C. E. T. Richmond, September 1, 1908, from R.A.M.C. Militia; 5456 Serjeant J. Uden, September 1, 1908, from R.A.M.C. Militia; 9299 Serjeant A. Jackson, August 12, 1908, from R.A.M.C. Militia; 16259 Corporal W. Thompson, August 27, 1908, from Egyptian Army; 1937 Private A. Cain, September 7, 1908, from Royal Field Artillery.

*Transferred to other Corps.*—10011 Serjeant J. H. Taylor, August 12, 1908, to West Riding and Northumbria Territorial School, Leeds; 7881 Staff-Serjeant T. Lever, September 1, 1908, 3rd N. Midland Field Artillery, Wolverhampton; 7772 Staff-Serjeant C. Watts, September 9, 1908, 2nd, N. Midland Field Artillery, Leicester.

**NOTES FROM ALDERSHOT.**—Staff-Sergeant T. E. Coggon writes (September 9, 1908): "The season having now come to an end, it is thought that a few remarks regarding the doings of the Corps Cricket Team in Aldershot would be of interest to other members of the Corps.

"The team has had a very successful season, having played 28 matches, winning 16, drawing 2, and losing 10. Taking into consideration the strength of our opponents, who include, besides practically the cream of military teams in the command, all the best local clubs over a considerable area around Aldershot and several of the London Hospitals, this record must be considered quite good. It is worthy of note that none of the regimental teams have succeeded in beating us, although the day when we can boast of having beaten our great rivals, the Army Service Corps, has still to come. Some most exciting games have been played, notably the match with the London Hospital C.C., on their ground; they made 178; when our last man—Corporal Keeble—went in we still wanted 21 to win. Corporals Keeble and Fish batted in great style and succeeded in winning the match. Some of the victories were of the most decisive nature, as we beat Oatlands Park, a very strong team, by 99 runs; Guildford by 279 for 8 wickets, against 116. Lieutenant J. C. Hart in this game made a brilliant century. We defeated the Royal Artillery by 294 for 6 wickets, to 149. At Bordon, against the Cheshire Regiment, our opening pair, Major Cochrane and Corporal Fish, made a great stand, 225 for the first wicket, Major Cochrane having hard luck in getting caught from a stroke which would have given him the coveted century, while Corporal Fish made 103, not out.

"Centuries for the team were made by: Lieutenant J. C. Hart, 101 *v.* Guildford; Serjeant H. Steele, 100 *v.* A.O.C.; Corporal Fish, 103, not out, *v.* Cheshire Regiment.

"Two centuries were made by our opponents, viz., F. Sinclair, 134 for Brookwood Asylum C.C.; Buller, 110, not out, for Basingstoke.

"The Cricket Club has suffered a great loss in the departure for India of Captain J. D. G. Macpherson, who has done so much for sport in every way in the Corps at Aldershot. He has been Hon. Secretary of the Cricket Club during the whole time he has been at Aldershot, and his loss will be severely felt. It will be seen by the averages below that the Captain, Major Cochrane, very fittingly heads the batting, and that Lieutenant J. C. Hart and Corporal Keeble run almost a dead heat for the first place in the bowling averages. Earlier in the season we failed by two runs to reach the total of 67 made by St. John's School, Leatherhead, on a wet wicket, although we had scored 53 for 5 wickets.

### BATTING AVERAGES.

| Names | No. of Innings | Times not out | No. of Runs | Most in Innings | Average |
|---|---|---|---|---|---|
| Major Cochrane | 26 | 0 | 714 | 98 | 27·46 |
| Lieut. A. L. Foster | 10 | 0 | 257 | 77 | 25·70 |
| Capt. Greenwood | 16 | 0 | 387 | 91 | 24·18 |
| Pte. Darby | 10 | 3 | 163 | 56 | 23·31 |
| Lieut. E. Gibbon | 5 | 1 | 91 | 32 | 22·75 |
| Lce.-Corpl. Fish | 23 | 2 | 472 | 103 | 22·47 |
| Lieut. J. E. Hart | 15 | 1 | 314 | 101 | 22·42 |
| Lce.-Corpl. Gordon | 14 | 2 | 255 | 60 | 21·25 |
| Lieut. A. H. Heslop | 20 | 1 | 386 | 62* | 20 31 |
| Pte. Mack | 10 | 2 | 153 | 42* | 19·12 |
| Sjt. H. Steel | 21 | 0 | 397 | 100 | 18·90 |
| Capt. Churton | 23 | 2 | 363 | 42 | 17·28 |
| Capt. Macpherson | 16 | 0 | 254 | 58 | 15·88 |
| Corpl. Keeble | 20 | 6 | 120 | 25* | 8·57 |
| Pte. Kirk | 9 | 2 | 50 | 17* | 7·14 |
| Boy Prince | 8 | 2 | 22 | 11 | 2·73 |
| Pte. Sinclair | 7 | 0 | 17 | 7 | 2·43 |

* Signifies "Not out."

### BOWLING AVERAGES.

| Names | Overs | Maidens | Runs | Wickets | Average |
|---|---|---|---|---|---|
| Lieut. Hart | 269 | 34 | 808 | 66 | 12·24 |
| Corpl. Keeble | 317 | 54 | 1,006 | 78 | 12·89 |
| Lce.-Corpl. Fish | 71 | 6 | 266 | 20 | 13·30 |
| Pte. Mack | 144 | 24 | 481 | 32 | 15·03 |
| Sjt. Steele | 55 | 4 | 232 | 14 | 16·57 |
| Lieut. Foster | 59 | 12 | 208 | 11 | 18·90 |
| Major Cochrane | 23 | 0 | 183 | 9 | 20·33 |

**NOTES FROM COLCHESTER.**—Forwarded by Captain S. J. McAllum, R.A.M.C. (T.):

"*Military Smoking Concert.*—A very enjoyable and pleasant evening was spent on Friday, August 21, in the Camp of the Royal Army Medical Corps (Militia), by the officers, N.C.O.'s and men of No. 9 Company, Royal Army Medical Corps, who were entertained at a well-arranged smoking concert, by the officers, N.C.O.'s and men of the Militia Company, at present training under canvas behind the Military Hospital. Lieutenant-Colonel E. L. Maunsell, R.A.M.C., presided. Master Tatam gave a selection on the piano, which was very well rendered. Corporal Nunn, R.A.M.C.(M.), sang 'The Donkey Boy from Cairo,' causing much laughter. Private Woods', R.A.M.C., song, 'The Old Brigade,' was well received, he being an old favourite. Mr. H. Tatam sang four humorous songs, all being very amusing. Captain F. Ashe, R.A.M.C., next gave four selections on the banjo with piano accompaniment, receiving great applause. Private G. Linton, R.A.M.C.(M.), sang 'Sons of the Sea' and 'I have an Hotel,' with good effect. Mr. Walstow also sang, and Mr. Bird was extremely funny in his 'Essex dialect' and an encore song. Several officers of the Royal Army Medical Corps and visitors from other branches of the Service in the Garrison were present. Captain McAllum, commanding No. 2 Company, R.A.M.C.(M.), thanked all for past and present favours, and regretted that this would be the last year that No. 2 Company would be able to train with No. 9 Company. Lieutenant-Colonel E. L. Maunsell, R.A.M.C., in response, spoke very highly of the Militia, and stated that No. 2 Company and No. 9 Company had really always been one. The health of both Companies was greeted with musical honours. Great praise is due to Staff-Serjeant W. F. Raven, R.A.M.C., who is Serjeant-Major of the Militia Company, for the way in which he catered, decorated, and managed the evening's programme."

**NOTES FROM IPSWICH.**—During the racing at Ipswich Regatta some excitement arose over a little boy, aged about 5 years, named Fred Harvey, living in Orwell Street. The youngster had pushed through into the front line of spectators on the Promenade, in the vicinity of the Umbrella, and by some means—possibly owing to the movement of the surging crowd of spectators—he tumbled into the water. The tide was running in at the time, and there was a good depth of water. In these circumstances Serjeant-Instructor Connell, R.A.M.C., promptly plunged into the river, without divesting himself of an article of clothing, and brought the boy ashore, amid the cheers of the large body of spectators. The boy was not much the worse for the immersion.

It is stated that the boy fell head foremost into a depth of about 13 feet of water. The pluck and promptitude of the rescuer were heartily cheered. Serjeant Elmy and Police-constable S. Firman were quickly on the scene. The boy sank twice before Serjeant Connell reached him, and had a very narrow escape.

**NOTES FROM THE SCOTTISH COMMAND.**—Captain E. Ryan writes: "*Training of No. 13 Company, Royal Army Medical Corps, Field Ambulance, Section A.*—The training was carried out this year at Barry Camp, from August 12 to 22, under the command of Lieutenant-Colonel H. W. Austin. Captains E. Ryan and J. H. Duguid, Lieutenants Lunn, Blake and Dickson, and Lieutenant and Quartermaster A. Clapshaw were present during the whole of the training, Major B. H. Scott and Captain L. Cotterill from August 18 to 22, and Colonel T. M. Corker, P.M.O., Scottish Command, during the last two days.

"Owing to the Company being scattered throughout the Scottish Command, and the number of camps still open, sufficient men could not be mustered to bring the *personnel* up to the required figure, *i.e.*, 60. Seventeen men and 1 bugler were supplied by the officer in charge of the Royal Army Medical Corps Records to complete the number. The equipment was, unfortunately, not complete, as there are no mobilisation stores for the Royal Army Medical Corps in this Command. This difficulty was met in the best spirit by both the Ordnance and Army Service Corps. The C.O.O. applied to Woolwich for an operating tent, but this was 'not available.' A laboratory tent had therefore to be substituted, so that instruction in pitching and striking the operating tent was lost.

"The training, which was in accordance with Extract from Royal Army Medical Corps Training, Part II., consisted of company, stretcher and waggon drill; lectures on sanitation, &c.; practical instruction in sanitation, &c.; the practical working of Brownlow's water-filter cart, and also of Thresh's disinfector, which is located at this camp. The contents of the new panniers were frequently shown, so as to make all familiar with them. The Aldershot field oven was erected and used in cooking for the detachment.

"The training included two most instructive field days. Striking camp in the early morning, the section moved off and pitched camp on the other side of Buddon, about three miles away, where an imaginary battle was taking place. The wounded were dressed and brought across a ravine by the stretcher squads, under the supervision of two officers, to the dressing station. This was represented by a bell tent, pitched in a hollow surrounded by hills, on the top of which distinguishing flags were erected. At the dressing station a field kitchen and latrine were dug; hot water was prepared, and other arrangements made for the further dressing of the wounded if required. The patients were then loaded into the ambulance waggons, and transferred to the field hospital, where everything was in readiness. A bell tent was erected to represent an operating tent, in which a table was prepared, instruments sterilized, &c. Another tent was used as a pack store, where the patients' kit and rifle were tallied. Yet another was used as an office from which the various returns were sent out. The 'patients' were kindly supplied by a detachment of 2nd Seaforth Highlanders, who were encamped close by.

"Night operations were also very successfully carried out, the search for wounded being conducted with the use of bull's-eye lanterns. The last day was allotted to the following competitions, for which cash prizes to the amount of £5 10s., subscribed by the officers, were given. (1) The best stretcher squad in dressing a wounded man, loading and carrying the stretcher. (2) The best No. 4 of the squads in the application of splints, dressing, and in initiative. (3) The best Nos. 1 and 3 at steadiness in carrying a loaded stretcher; this was tested by placing a glass filled with water on one of the handles of each stretcher. The distance was about 100 yards and included the crossing of a ditch. (4) The best tent-pitching squad. (5) The final event, a tug of war, for which five teams, each captained by an officer, competed.

"Colonel Corker, in distributing the prizes, congratulated Lieutenant-Colonel Austin on having carried out a very successful training, including the organisation of most useful competitions. With reference to the competition in dressing wounds, he had himself chosen somewhat general injuries of a severe character, in order to test their general knowledge of bullet injuries; he noticed that in two stretcher parties, control of all the main arteries was at once attended to and maintained throughout. The transport of wounded over ditches with a glass of water on the stretcher developed some exceedingly clever work.

"The Principal Medical Officer then spoke on the Territorial Field Ambulances. He said that in these ambulances both officers and men were exceedingly keen, and studied and practised continually, and it behoved the Regular Army to do the same if they wished to maintain their reputation for smartness and efficiency. In conclusion, he said that all had had a very useful and pleasant outing, and he hoped that next year it would be equally successful, with, perhaps, the introduction of additional features.

"The proceedings terminated with three lusty cheers for Colonel Corker, Lieutenant-Colonel Austin, the Officers, the Quartermaster who had looked after everybody's interests, and Serjeant-Major Hill.

"The arrangements for the officers and men's messing were excellent; they were made by Lieutenant and Quartermaster A. Clapshaw. The men had a marquee tent, forms, tables and enamelled ware; the small extra expense was more than repaid in the general comfort.

"The night before leaving camp several officers came to dine. A piano was lent, and Captain Cotterill borrowed a stand of pipes on which he performed. Songs were rendered by the Principal Medical Officer, Captain Cotterill, Captain Kidd, R.A.M.C.(T.), Lieutenant and Quartermaster Clapshaw and others.

"Facing this page is a group of the officers who were present.

"Several of our colleagues will shortly leave us for foreign service, Lieutenant-Colonel W. A. Morris and Major E. W. Slayter for India; Captain P. T. MacKossack for Mauritius; Captain H. C. Sidgwick returns to Jamaica, where he was badly smashed up during the last earthquake, and Lieutenants W. E. C. Lunn and J. A. B. Sim for India."

**NOTES FROM BELFAST.**—Captain G. J. Stoney Archer writes (September 14, 1908): "Lieutenant-Colonel J. R. Dodd, having been appointed Administrative Medical Officer, Cork District, leaves Belfast this day to take up his appointment. Lieutenant-Colonel R. Porter, R.A.M.C., takes over the duties of Administrative Medical Officer, Belfast District, pending the appointment of a successor to Lieutenant-Colonel J. R. Dodd. Captain J. W. West, R.A.M.C., has been posted to Londonderry, and Captain T. F. Ritchie, R.A.M.C., transferred to the Cork District for duty. Captain E. P. Sewell, R.A.M.C., on arrival in Belfast, will take over the duties of Sanitary Specialist. Lieutenant-Colonel J. B. Buchanan, R.A.M.C., Captains J. H. R. Winder and A. McMunn, with fifty N.C.O.'s and men, proceeded to the Curragh on the 25th ult., for training with the Field Ambulance. No. 3 Company Royal Army Medical Corps Militia took over the duties during the absence of the Royal Army Medical Corps, and were inspected by Colonel Sir R. A. Clark on the 7th inst.

"The annual outing of the 15th Company took place on the 15th ult., and proved, as usual, a great success. Larne was the place selected, a pretty drive, about 20 miles from Belfast. The weather was all that could be desired. Lunch was provided at the Crown Hotel, and after the usual toasts and country strolls the party proceeded on the homeward journey. An impromptu concert was held at a halt on the way home, and after several members of the Company had rendered their sentimental and humorous ditties, which were thoroughly enjoyed, they continued the journey to Belfast, thus ending one of the many happy outings of the 15th Company.

"Staff-Serjeant G. W. Petch, Serjeant C. Dunglison, and Private F. Marrable left for the depôt on the 8th inst., prior to embarkation on the 'Soudan' for a tour of service in China. Serjeant Dunglison, who for some time had been Senior Medical Officer's Clerk, was presented by the detachment with a suitably-engraved English lever watch, as an appreciation of his services as secretary of the sports club, &c."

**NOTES FROM MALTA.**—Major Pollock writes (September 10, 1908): "The cricket season, during which we have not distinguished ourselves, has now come to an end. We can, however, console ourselves with the fact that our team put up a very good fight against the 3rd King's Royal Regiment in the second round of the Soldiers' Cup, and were only beaten by one wicket after a most exciting game. Private Pegram and Cowx were our mainstays, the former making 82 in the first innings, which included 13 'fours,' and 20 in the second innings. Cowx's bowling is worthy of special mention; in the first innings he bowled 30 overs with 19 'maidens' and took 7 wickets for 49 runs; in the second innings he took 6 wickets for 47 runs, bowling 20 overs with 10 'maidens.'

"*Royal Army Medical Corps Serjeants* '*At Home.*'—The annual 'At Home' of the Royal Army Medical Corps Serjeants' Messes, Valletta and Cottonera, took place on Tuesday, September 8, in the spacious grounds at Cottonera Hospital. The day was an ideal one, and the grounds being tastefully decorated, the change from the dusty monotony we are accustomed to out here to the shaded glades that had been arranged gave one and all a contented feeling of ease. The tea tables were set in three marquees, and they were laid out in a most inviting manner. For this we have to thank the ladies of the Corps, of whom Mrs. Lowe, Mrs. Chappell, Mrs. Underwood, and Mrs. Kirby deserve especial mention for the manner in which they performed this work. The guests began to arrive promptly at 3 p.m., and after the usual formalities of reception had been gone through the merriment began. One and all had come with the idea of having a thoroughly good day and they were not disappointed. The sources of amusement comprised tennis, quoits, puff billiards, shooting galleries, ping pong, fixing the pig's tail, and bubble-blowing. In addition to these, there were donkey rides for the children, and last, but best, was an invention of Serjeant-Major Lowe's, called tobogganing. This created untold mirth both to young and old, and undoubtedly was the success of the day. It appealed to the officers who were present, and it was gratifying to see them sliding down with the children, and enjoying themselves in so hearty a fashion.

"Amongst those present were: Lieutenant-Colonel Jennings, Lieutenant-Colonel Rhodes, Mrs. and Miss Rhodes, Major and Mrs. Williams, Majors Fleming, Fleury, and Pollock, Captains Anderson, Carter, Maughan and Gibbon, Lieutenants Green, Morrison and Pilgrim, R.A.M.C., Surgeon-Captain Mifsud, R.M.A., Lieutenant Long, R.G.A., Lieutenant Fasson, A.O.D., and Mrs. Fasson, Matron Miss Rannie, and Sisters of Queen Alexandra's Imperial Military Nursing Service, Miss Nicholls, Head Nurse Military Families Hospital, and other ladies.

"Tea, of which about 350 people partook, was served in two sitings, the first at 4.30 p.m. and the second at 5.30 p.m.

"By the kind permission of Major A. J. Hancocks and officers, the band of the 1st Battalion Royal Inniskilling Fusiliers played the following selections from 5 p.m. to 7.30 p.m.:—

"PROGRAMME.

| | | |
|---|---|---|
| *March* | 'Pioneer' | *Adams.* |
| *Valse* | 'May I have the Pleasure?' | *Lincke.* |
| *Selection* | 'Jolly Jingles' | *Neat.* |
| *Gavotte* | 'Mignon' | *Thomas.* |
| *Selection* | 'By the Mississippi' | *Knowles.* |
| *Song* (*Cornet Solo*) | 'Because' | *D'Hardelot* |
| *Valse* | 'The Merry Widow' | *Lebar.* |
| *Patrol* | 'The Wee Macgregor | *Amers.* |
| *Selection* | 'Miss Hook of Holland' | *Rubens.* |
| *Sketch* | 'Ireland for Ever' | *Myddleton.* |
| *Serenade* | 'Standchen' | *Czibulka.* |
| *American March* (*Descriptive*) | 'The Husking Bee' | *Thurban.* |

"The spontaneous applause which followed the finish of the above must have satisfied the performers, and Bandmaster Norris' face was wreathed in smiles as he acknowledged it. It was dark ere the band had finished, but during the interim the coloured lamps and lanterns had been lit, and these, aided by the light of three acetylene lamps, together with the moon, which was just rising, made the dancing which followed the musical programme delightful. During the intervals between the dances, ices and sandwiches were distributed, and from the way these disappeared dancing is evidently an inducement to recover a lost appetite. The end came shortly after 10 p.m., and with reluctant partings and reiterated thanks from our gratified guests, our happiest day of the year was over.

"A final word is due to the Committee for the way they co-operated, and the unstinted praise given by their brother N.C.O.'s to Quartermaster-Serjeant Chappell and Serjeants Gray, Jarvis and Kirby, testifies how well pleased one and all were with the arrangements."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, R.A.M.C., writes: "Her many friends will regret to hear that Miss A. Garriock, R.R.C., did not continue to make satisfactory progress, and on August 9 it was found necessary to amputate the injured foot. Miss Garriock bore the operation well, and is, at the time of writing, on the high road to recovery.

"The hockey team is still pursuing its victorious career. Since my last letter we have played the following matches:—

| *Versus* | Played | Won | Drawn | Lost |
|---|---|---|---|---|
| Serjeants 3rd Worcestershires | 3 | 1 | 1 | 1 |
| Nomads | 1 | — | 1 | — |
| Rovers | 4 | 3 | — | 1 |
| Claremont | 2 | 1 | — | 1 |
| Garrison Serjeants' Mess | 1 | 1 | — | — |
| Royal Garrison Artillery | 2 | 1 | 1 | — |
| Detachment Loyal North Lancashires | 1 | 1 | — | — |
| Total | 14 | 8 | 3 | 3 |

while several of our players have represented the Army in big matches.

"Captain E. H. M. Moore, on return from leave, proceeds to Potchefstroom; Lieutenant W. H. Forsyth has passed in (*h*) *i*, *ii* and *iii*, and has left for Middelburg; Major H. W. H. O'Reilly and Captain E. H. Gatt sail with the Worcestershires for home; Lieutenant-Colonel N. C. Ferguson, C.M.G., Major T. J. Lenehan, and Captain F. W. W. Dawson also sail later. Serjeant Hazell and Private Groom embark on the 'Avondale Castle' on September 7 for trooping duty.

"To institute a Branch of the Soldiers' and Sailors' Help Society a grand concert, in which the massed bands of the Garrison and Volunteers will appear, has been arranged to take place in the City Hall, Cape Town, on September 3, under the patronage and in the presence of H. E. Sir W. Hely-Hutchinson, K.C.M.G., Lord Methuen, G.C.B., Vice-Admiral Sir E. S. Poë, K.C.B., Major-General Sir R. Hart, V.C., &c., and Headquarter Staff.

"Serjeant-Major Kinsella has been selected to sing as representing the Army, a compliment which, needless to say, is much appreciated."

**NOTES FROM CAIRO.**—Private W. P. Cross writes (August 26, 1908): "No. 33 Company, Royal Army Medical Corps, Cricket Club, Cairo, Egypt. Season 1908. Matches played, 35. Won 24, lost 6, drawn 4, abandoned 1. Total, 35. The past season has been a most successful one. The results show a record of which the Company may justly be proud. Practically the whole of the success of the season has been due to the interest the officers have taken in the Recreation Club, in allowing the men to get away for matches. The Company are indebted to Major Jameson and Lieutenant Graham, both of whom have on several occasions rendered excellent help.

"The batting and bowling averages of the Company are as follows:—

BATTING AVERAGES.

| | No. of Innings | Times not out | No. of Runs | Most in Innings | Average |
|---|---|---|---|---|---|
| Pte. Cross .. .. .. .. | 25 | 3 | 641 | 108* | 29·13 |
| Lieut. Graham .. .. .. | 12 | | 300 | 71 | 25·00 |
| Pte. A. F. Day .. .. .. | 26 | 1 | 561 | 84* | 22·40 |
| Pte. Breeze .. .. .. | 30 | — | 441 | 43 | 14·70 |
| Pte. G. H. Green (Capt.) .. | 23 | 1 | 317 | 42 | 14·40 |
| Pte. Cowie .. .. .. | 19 | 3 | 227 | 58* | 14·18 |
| Pte. Davidson .. .. .. | 25 | 3 | 251 | 51* | 11·40 |
| Pte. Hollands .. .. .. | 27 | 2 | 269 | 30 | 10·76 |
| Pte. Bogosoff .. .. .. | 28 | 3 | 191 | 28 | 7·64 |
| Major Jameson .. .. .. | 15 | — | 112 | 31 | 7·46 |
| Pte. G. G. Young .. .. | 17 | 2 | 107 | 26 | 7·13 |

* Signifies "Not out."

BOWLING AVERAGES.

| | No. of Innings Bowled in | Wickets | Runs | Average, per Wicket |
|---|---|---|---|---|
| Pte. Cross .. .. .. .. | 23 | 87 | 502 | 5·77 |
| Pte. Breeze .. .. .. | 26 | 89 | 623 | 7·00 |
| Pte. G. H. Green (Capt.) .. | 17 | 41 | 322 | 7·84 |
| Lieut. Graham .. .. .. | 10 | 22 | 233 | 10·59 |
| Pte. A. F. Day .. .. .. | 7 | 8 | 88 | 11·00 |
| Pte. Davidson .. .. .. | 19 | 28 | 309 | 11 03 |

**NOTES FROM POTCHEFSTROOM, SOUTH AFRICA.**—Lieutenant A. E. S. Irvine, R.A.M.C., writes (August 2, 1908): "Our Detachment held their sports on June 8, and they were a great success. All the races were keenly contested, and in the open events there were a large number of competitors from the garrison. The officers' race was won by Captain Dudding; the serjeants' race was carried off by Serjeant-Major Bollen, who showed a wonderful turn of speed. The officers were 'At Home' and entertained a large number of friends, including Brigadier General and Mrs. Porter.

"The following cutting from the *Western Chronicle and Potchefstroom Budget*, Friday, June 12, 1908, gives an account of the various events:—

"'In ideal weather last Whit Monday on the Recreation Ground at the Military Hospital, Potchefstroom, before a large assemblage, the athletic sports of the Royal

Army Medical Corps were held, and a most enjoyable afternoon was spent. Several marquees were erected at different parts of the field, and all distances had been specially prepared and were marked out with distinguishing flags in appropriate fashion. Event followed event, there not being a hitch in the arrangements throughout the day.

"'Great praise is due to the Committee, constituted as follows: President, Lieutenant-Colonel J. Maher, R.A.M.C , Serjeant-Major F. J. Bollen, Staff-Serjeant H. J. Polhill, Corporal E. Billott, Lance-Corporal Jessop, Privates Lines and Fordham.

"'Serjeant-Major Bollen, President of the Sub-Committee, Quartermaster-Serjeant Beaumont and Staff-Serjeant Polhill, members of the above Committee, along with the caterers, Serjeants Robinson and Watson, Lance-Corporal Jessop, and the clerk of the course, Private Turnbull, deserve special mention as having contributed greatly, directly and indirectly, towards the immense success of the sports. The other officials, Lieutenant A. E. S. Irvine, starter, Lieutenants T. W. Sexton and H. S. Brook, judges, filled their *rôles* with equal success.

"'The officers of the Royal Army Medical Corps were "At Home." Among the interested spectators were Brigadier-General Porter, commanding Potchefstroom Sub-District, and Mrs. Porter. The Serjeants were also "At Home," and had many guests from the other messes in the garrison.

"'Serjeant-Major Bollen, in addition to his task as timekeeper, had many arduous duties to perform, and his name deservedly claims attention, for to his energetic work much of the success of the sports may be attributed.

"'Mrs. Maher, wife of Lieutenant-Colonel J. Maher, R.A.M.C., senior Medical Officer, Potchefstroom District, presented the prizes at the conclusion of the sports. Private G. Smith came in for a rousing cheer when he stepped up to receive the championship prize presented by the Matron and Sisters for the highest aggregate obtained in certain events enumerated for the Royal Army Medical Corps.

"'Three hearty cheers for the officers were instantly raised by the onlookers, and the crowd shortly after dispersed.

"'Below is appended a list of the winners of the various events:—

"'One of the most amusing incidents of the afternoon was a cycle race between several of the Kaffirs employed at the hospital compound. The distance was measured for a mile (6 laps round). Willem, who was at one time considered a hot favourite, finished the race a lap behind. Result. 1, Jim ; 2, Tom , 3, Michael

"'*Potato Race.*—1, Private Lines ; 2, Cove ; 3, Brown ; 4, Alderton.

"'*Committee Race*, 200 *Yards.*—1, Private Lines; 2, Staff-Serjeant Polhill; 3, Lance-Corporal Jessop.

"'*Egg and Spoon Race.*—1, Brown ; 2, Cove.

"'*Thread and Needle Race* (*Ladies*).—Quite a good number of the fair sex turned up. and the antics displayed during this exhibition much amused the spectators. 1, Mrs. James; 2, Mrs. Brown; 3, Miss G. Brook.

"'*Children's Race.* — 1, Wilfred Bollen ; 2, Bobbie Beaumont; 3, Gladys Beaumont.

"'*Officers' Race*, 100 *Yards.*—1, Captain Dudding; 2, Lieutenant Irvine; 3, Lieutenant Sexton.

"'*Tug of War, Final.*—"A" Team, coached by Serjeant Robinson, romped home winners, after beating "C" Team, the result of a hard pull.

"'*Throwing the Cricket Ball.*—1, Corporal Alderton ; (85 yards 1 inch); 2, Private Dean.

"'*Tug-of-War Teams of* 8 *Heats.*— "A" Team beat "B" Team.

"'*Long Jump.*—1, Private G. Smith; 2, Private Thorn.

"'*Putting the Shot.*—1, Private Haddow ; 2, Private Clarke.

"'*Three-legged Race.*—1, Thorn and Alderton ; 2, Holmes and Turnbull.

"'*Half-Mile Flat* (*Open*).—1, Driver Garrick (Army Service Corps); 2, Corporal Praeger (9th Lancers); 3, Private Underwood (4th Hussars).

"'*Sack Race.*—1, Private Haddow ; 2, Private G. Smith ; Private Clements.

"'*Boot Race.*— 1, Lance-Corporal Alderton ; 2, Private G. Smith ; 3, Private Clements.

"'220 *Yards Flat.*—1, Private G. Smith; 2, Thorn; 3, Tarner.

"'120 *Yards Serjeants' Race* (*Handicap*).—1, Serjeant-Major Bollen ; 2, Serjeant Robinson; 3, Staff-Serjeant Polhill.

"'100 *Yards Flat* (*Open*).—1, Corporal Williams (4th Hussars); 2, Underwood (4th Hussars) ; 3 Corporal Praeger (9th Lancers).'

"During the early part of June our Detachment went through the training of the Cavalry Ambulance for South Africa. At the end of the training the entire *personnel*—ambulance waggons, transports, &c.—marched out of the hospital, and there was a practice field-day about three miles from camp. The site for the ambulance station was chosen, the scene of the imaginary action selected, and the wounded were posted on a kopje. The Bearer Division went out, and the wounded were rapidly collected and brought in by the ambulances to the operating tent. The improvised splints, &c., were excellent, the men thoroughly entering into the spirit of the training. In the meantime the tents, &c., were rapidly got ready; when the wounded arrived everything was in readiness to receive them. The experience learnt from the training will be most useful. Captain Dudding, Lieutenant Anderson, and Lieutenant Littlejohns, who were here in medical charge of various brigades of Artillery at their annual practice, attended the Cavalry Field Ambulance training.

"On June 23 Lord Methuen, G.O.C.S.A., accompanied by his daughter, visited the hospital at 5 p.m.

"Surgeon-General W. W. Kenny and Major J. M. Buist made their annual sanitary inspection of the hospital and cantonments on July 3. During Lord Methuen's visit to Potchefstroom it was officially announced that this station was to be kept open for at least another eighteen months. This announcement caused great rejoicings in both the cantonment and the town.

"The football season has just come to a close. Our XI. went through their entire list of fixtures, and always played a sporting game. We won several matches, and considering the few men there are to select from, our team deserve great credit for the plucky way in which they played, they were always dangerous opponents.

"Private Cove arranged another excellent concert, which took place on July 25. There would probably be an attendance of over three hundred persons when the concert commenced. We were all pleased that Miss Gladys Bollen, daughter of our popular Serjeant-Major, was able to sing. She was loudly applauded when she appeared, as she had not quite recovered from a very unpleasant accident, having only a few days previously been thrown out of a Cape cart near No. 2 Gate and received a severe shock and several serious injuries. Miss G. Brook had to respond to an encore for her song. The Motor Car sketch by Private Cove and Master Bollen was excellently staged and caused much amusement.

"The comic element was supplied by the well-known 9th Lancers' comedians, whose patter and singing were loudly applauded and encored. Staff-Serjeant Bangert gave a skilled exhibition of Indian club swinging.

"VARIETY ENTERTAINMENT AT HOSPITAL THEATRE, POTCHEFSTROOM, SATURDAY EVENING, JULY 25, 1908. (BY KIND PERMISSION OF LIEUTENANT-COLONEL J. MAHER, R.A.M.C.) TO COMMENCE AT 8 P.M. SHARP.

"PROGRAMME.

"Part 1.

| | | | |
|---|---|---|---|
| (1) | *Pianoforte* | Selected | Pte. Bevington, 9th Lancers. |
| (2) | *Song* | Selected | Serjt. Westcombe, 9th Lancers. |
| (3) | *Violin Solo* | Selected | Pte. Hockey, 4th Hussars. |
| (4) | *Comic Song* | 'The Kerbstone Millionaire' | Pte. Hawkins, 9th Lancers. |
| (5) | *Song* | 'The Diamond King' | Master Rose, R.F.A. |
| (6) | *Comic Song* | 'You do Soon Change your Mind' | Lce.-Cpl. Forbester. |
| (7) | *Song* | 'If Everyone were as Kind as You' | Tptr. Lloyd. |
| (8) | *Song* | 'Sleep and Forget' | Miss G. Bollen. |
| (9) | *Song* | 'When the Corn is Waving' | Pte. Ward, 4th Hussars. |
| (10) | *Comic Sketch* | 'The Motorist' | Pte. Cove and Master Bollen. |

"Part 2.

| | | | |
|---|---|---|---|
| (1) | *Pianoforte* | Selected | Pte. Bevington. |
| (2) | *Comedy Turn* | 'Down by the River' | Lce.-Cpl. Forbester and Pte. Hawkins. |
| (3) | *Song* | 'You and I' | Miss G. Brook. |
| (4) | *Comic Song* | 'I got off at Clapham' | Pte. Bevington. |
| (5) | *Song* | 'The Old Countree' | Serjt.-Major Lindop, R.F.A. |
| (6) | *Comic Song* | 'Would you Mind Passing the Salt?' | Pte. Dykes. |
| (7) | *Mandoline Duet* | March (Gordon) | Cpls. Keysell and Purcy. |
| (8) | *Duet* | 'The Children's Hour' | Ptes. Martin and Hoskins. |
| (9) | *Exhibition of Indian Club Swinging* | | Staff-Serjt. Bangert. |
| (10) | *Comic Sketch* | (Leg Bail) | Lce.-Corpl. Forbester, Pte. Dykes, Pte. Bevington and Tptr. Lloyd. |

"*Scene*—Charge office of prison.

"*Accompanists*—Miss G. Brook, Miss B. Bollen, Ptes. Bevington and Houghton.

"GOD SAVE THE KING.

"Too much praise cannot be given to Private Cove for his energy in arranging the concert, and also to the friends in the Garrison who sang for us. Private Cove made a permanent stage for us in the theatre, putting in much of his leisure time to improve it.

"Lieutenant-Colonel Maher proposed a vote of thanks to the performers, which was passed with acclamation by a very large and appreciative audience.

"Lieutenant-Colonel Maher will be in charge of a section of the Cavalry Field Ambulance during the forthcoming manœuvres.

"Lieutenant Sexton, Medical Officer, will be in charge of the 9th Lancers.

"Serjeant-Major Bollen, Quartermaster-Serjeant Beaumont, Serjeant Robinson, Serjeant Jones, two corporals and eight privates will leave here on the 10th inst. and proceed to Hamaan's Kraal,"

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, Secretary to Principal Medical Officer, His Majesty's Forces in India, writes (August 20, 1908):—

"*Appointments.*—The following officers have been detailed for service at Aden during the ensuing trooping season:

"(1) Lieutenant-Colonel A. Kennedy, 5th (Mhow) Division, to relieve Lieutenant-Colonel J. Fallon, and sail by 1st Transport "Rohilla," October 2, 1908, from Karachi, to command Station Hospital, Aden.

"(2) Captain D. P. Watson, D.P.H., 4th (Quetta) Division, to relieve Captain J. M. H. Conway, and sail by 1st Transport "Rohilla," October 2, 1908, from Karachi. This officer will be appointed to charge of the Brigade Laboratory.

"(3) Captain A. A. Meadon, 5th (Mhow) Division, to relieve Captain C. H. Carr, and sail by 5th Transport "Rohilla," December 3, 1908, from Bombay.

"(4) Major C. Dalton, V.H.S., 2nd (Rawal Pindi) Division, to relieve Major F. R. Buswell, and sail by 11th Transport "Plassy" (Hospital Ship), March 4, 1909, from Bombay.

"(5) Captain F. M. M. Ommanney, 3rd (Lahore) Division, to relieve Captain B. H. V. Dunbar, and sail by 11th Transport "Plassy" (Hospital Ship), March 4, 1909, from Bombay.

"*Leave.*—Major J. B. Anderson is granted one month's extension of general leave ex India from October 4, 1908. Major J. W. Jennings, D.S.O., is granted leave on medical certificate ex-India in continuation of general leave from August 31, 1908, to October 30, 1908.

"*Specialists.*—Captain W. F. Ellis is appointed Specialist in (c) Advanced Operative Surgery in 3rd (Lahore) Division, with effect from August 15, 1908."

## ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Major Thomas F. Dewar, M.D., to be Surgeon-Lieutenant-Colonel, dated July 28, 1908.

Surgeon-Captain William K. Clayton to be Surgeon-Major, dated August 18, 1908.

## ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

*1st Shropshire and Staffordshire Royal Garrison Artillery.*—Surgeon-Captain Wheelton Hind, M.D., resigns his commission, dated March 31, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon Colonel John P. Massingham resigns his commission, with permission to retain his rank, and to wear the prescribed uniform, dated March 27, 1908.

*6th Volunteer Battalion, The Royal Scots (Lothian Regiment).*—The undermentioned officers resign their commissions: Surgeon-Captain Clement B. Gunn, M.D., and Surgeon-Lieutenant James H. Horsburgh, dated March 31, 1908.

*3rd Volunteer Battalion, The Queen's (Royal West Surrey Regiment).*—The undermentioned officer resigns his commission: Surgeon-Lieutenant Edmund F. Rose, dated March 31, 1908.

*2nd Volunteer Battalion, The Royal Fusiliers (City of London Regiment).*—Surgeon-Captain Michael G. Foster resigns his commission, dated March 31, 1908.

*2nd Volunteer Battalion, The Royal Scots Fusiliers.*—The undermentioned officer resigns his commission: Surgeon-Lieutenant Robert Nelson, M.B., dated March 31, 1908.

*1st Volunteer Battalion, The Duke of Cornwall's Light Infantry.*—The undermentioned officer resigns his commission: Surgeon-Captain Francis Chown, M.B., dated March 31, 1908.

*1st Volunteer Battalion, The Northamptonshire Regiment*—The undermentioned officer resigns his commission: Surgeon-Captain Herbert S. Baker, dated March 31, 1908.

*4th Volunteer Battalion, The Queen's Own (Royal West Kent).*—The undermentioned officer resigns his commission: Surgeon-Captain Arthur T. F. Brown, M.B., dated March 30, 1908.

*2nd Volunteer Battalion, The Highland Light Infantry.*—The undermentioned officer resigns his commission, with permission to retain his rank, and to wear the prescribed uniform: Surgeon-Major Walter Sandeman, M.B., dated March 31, 1908.

The undermentioned officer resigns his commission: Surgeon-Lieutenant William S. Paterson, M.B., dated March 31, 1908.

## EXAMINATIONS.

Results of examination of Lieutenants, Royal Army Medical Corps:—

Passed in (*h*) *i* for rank of Captain: W. C. Nimmo, G. B. F. Churchill, T. Scatchard, T. C. C. Leslie.

## THE ARMY AND NAVY MALE NURSES' CO-OPERATION.

The following subscriptions have been received and paid to the Co-operation by the Officer commanding No. 6 Company, Royal Army Medical Corps:—

| | £ | s. | d. | | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| Headquarters No. 5 Company, R.A.M.C. .. .. .. | 4 | 13 | 0 | Capt. P. S. O'Reilly, R.A.M.C... | 0 | 5 | 0 |
| Lieut.-Col. W. G. A. Bedford, C.M.G., R.A.M.C. .. .. | 1 | 1 | 0 | Capt. B. R. Dennis, R.A.M.C... | 0 | 5 | 0 |
| Major L. Way. R.A.M.C. .. | 0 | 10 | 0 | Capt. W. Riach, R.A.M.C. .. | 0 | 5 | 0 |
| Major E. W. Bliss, R.A.M.C. | 0 | 10 | 0 | Total .. | £7 | 9 | 0 |

## COOKING IN MILITARY HOSPITALS.

With a view to encouraging increased proficiency in this subject, a Shield has been offered for annual competition amongst the trained cooks of the Royal Army Medical Corps. The Shield will be competed for annually at the "Universal Cookery and Food Exhibition," held this year at the Royal Horticultural Hall, Westminster, from November 3 to 7 inclusive.

Teams will consist of two non-commissioned officers or men of the cooking section from the military hospitals in the United Kingdom at which superintending cooks are authorised. The latter will accompany the teams and be responsible for their attendance, but will take no part whatever in the competition.

The team allotted most marks will win the Shield for the year, and the name of their hospital will be engraved upon it. The Shield will be retained at the hospital winning it until the next competition, the responsibility for surrendering it to the Association Headquarters by November 1 in each year resting with the officer in charge. The winners will also, through the kindness of the "Universal Cookery and Food Association," be awarded silver medals, and the superintending cook in charge a special silver medal and diploma. The team gaining second place will receive bronze medals from the Association. According to results, special prizes will also be awarded to superintending cooks in charge of teams adjudged second and third in order of merit.

The competition will consist of practical tests in preparing dishes from the various articles composing the different diets as per Diet Table (Army Form I., 1203). Competitors are not allowed notes to work from. Points will be awarded by judges appointed by the Association (Exhibition Council) for—(1) Practical knowledge; (2) method of work; (3) cleanliness in work; (4) economy in materials and utensils; (5) excellence of result when cooked and ready for serving, including flavour and appearance.

A time limit will be fixed and marks awarded for smartness and efficiency, combined with the foregoing.

The competitors will be required to prepare their dishes before the judge and public. They will bring cooks' aprons and caps to wear when cooking. Each competitor will draw for the *menu* to be prepared by him.

The syllabus of the competition dishes for this year is as follows:—

(1) Boiled chicken and white sauce, barley water, milk pudding.
(2) Beef tea, grilled chop and potatoes, scrambled eggs.
(3) Fried fish and white sauce, haricot beans, rice water.
(4) Boiled fish and sauce, mutton broth, scrambled eggs.
(5) Fish cakes, baked custard, lemonade.
(6) Stewed rabbit, tapioca pudding, gruel.
(7) Stewed steak, boiled potatoes, sago pudding, beef juice.
(8) Roast chicken with bread sauce, chip potatoes, rice pudding, egg flip.

All materials will be provided by the Universal Cookery and Food Association.

A special prize will also be offered for individual competition (optional) for the best invalid tray consisting of three dishes and two beverages (one beef tea). Superintending cooks of any rank may enter for this.

Applications for entry should be made on the accompanying form not later than October 1, and posted to the Secretary, Universal Cookery and Food Association.

THE NINETEENTH UNIVERSAL COOKERY AND FOOD EXHIBITION,
ROYAL HORTICULTURAL HALL WESTMINSTER, S.W.,
NOVEMBER 3—7, 1908.

This form to be sent to the Secretary of the Universal Cookery and Food Association, marked "Exhibition," 329, Vauxhall Bridge Road, Victoria Station, S.W.

MILITARY HOSPITALS COOKERY COMPETITION ENTRY FORM.

I desire to enter the following team for the above competition.

Station _ Rank

Date Commanding _ _ _ __ Regts.

| Rank | Name | Company |
|---|---|---|
| | | |

N.B.—The competitors entered must be qualified cooks.

## REGISTER FOR INDIAN SERVANTS.

FEW officers, on going to India, have not experienced the difficulty of getting good servants. The discomforts on arrival and of a long journey up country, unprovided with a bearer, or, what is worse, provided with a hastily-selected man, taken haphazard from the crowd of indifferent or bad characters who congregate in Bombay, have fallen to the lot of most of us, whilst the period of trial and vexation until a proper staff of servants is secured is familiar to us all.

In our Corps, with regular annual reliefs, it should not be difficult to arrange for an interchange. Officers leaving India would then be able to provide places for the good and tried retainers they are relinquishing, and new arrivals would, by taking on these men, be spared many of the worries and troubles which now befall them. Further, good servants would not be lost to the Corps, and the prospects of continuous employment could not fail to have attraction for the better class of men.

With these ends in view, officers due home from India are requested to communicate to the Journal particulars of servants whom they can recommend, so that officers going out in relief may have an opportunity of securing these men. The particulars required are :—

(1) Class of servant.
(2) Whether for bachelor or married officer.
(3) District or station to which he belongs.
(4) Any special recommendations.

NOTE.—The date the officer leaves India should also be stated, and when and where the servant will be available.

Colonel Rainsford recommends his former servant, Jaq Mahun.

(1) Bearer.
(2) Bachelor or married officer.
(3) Dalhousie; care of Hira Lall, Springfield Hotel.
(4) "He acted as my bearer during the whole of my last tour in India and North China."

Captain S. B. Smith recommends his servants. He leaves India on November 14, 1908.

(1) Bearer.
(2) Bachelor or married officer.
(3) Ambala, Sadar Bazaar.
(4) "In camp or cantonment has always given complete satisfaction. With previous employer thirteen years."
Address—Kadr Bux, Bearer, near Dhobie Ghat, Godar Bazaar, Ambala.

(1) Khitmatgar.
(2) Married officer.
(3) Aligarh.
(4) "A quiet, honest man; rather retiring disposition."
Address—Rohein Bux, Khitmatgar, Chandous, Aligarh.

(1) Cook.
(2) Married officer.
(3) Fategarh.
(4) "A good plain cook, charges moderate."
Address—Abdul Ali, Kansamah, care of Postmaster, Fategarh.

(1) Bhisti and Mashalchi.
(2) Married or single officer.
(3) Ambala, B. C. Bazaar.
(4) "A quiet, hard-working man."
Address—Khaj Mohamet, Bishtie Lines, B. C. Bazaar, Ambala.
Present employer leaving India November 14, 1908.

Captain W. W. Browne strongly recommends his servant, Sheik Oomar, for a bachelor. The man will be available at Bombay after October 30, 1908.

Address—Care of No. 3105 Private Abdul Rahman, B Company, 86th Carnatic Infantry, Secunderabad.

"This is an exceptionally good servant both in cantonment and camp. He is a first-rate cook and will do anything. After seeing a good deal of other fellows' servants I strongly advise any man going to Burma to secure him. He speaks Tamil, Telugu, English, Hindustani, and Burmese."

## BIRTH.

FUHR.—On August 24, at 7, The Villas, Hounslow, the wife of Captain R. H. Fuhr, D.S.O., R.A.M.C., of a son, still-born.

# EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd.,* 8, *Serle Street, London, W.C., not later than the* 22*nd of the month.*

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# Notices.

## EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S.W.

Communications have been received from Major R. J. A. Durant, Lieutenant R. G. F. Tate, Captain S. J. McAllum, Lieutenant-Colonel Godson, Captain R. McK. Skinner, Staff-Serjeant T. E. Coggon, Lieutenant-Colonel Wilson, Major Wanhill, Lieutenant-Colonel E. Butt, Major P. Evans, Captain E. A. Bourke, Major E. B. Steel, Captain F. J. Turner, Major D. Dawson, Captain L. Bousfield, and Lieutenant-Colonel J. R. Forrest.

The following periodicals have been received:—

*British: The Hospital, British Medical Journal, Lancet, Army and Navy Gazette, The All-India Hospital Assistants' Journal, The Australian Medical Gazette, The Practitioner, The Royal Engineers' Journal, The Journal of Tropical Medicine and Hygiene, Public Health, Journal of the Royal Sanitary Institute, Red Cross News, Medical Press and Circular, The Military Surgeon, Guy's Hospital Gazette, St. Bartholomew's Hospital Gazette, Journal of the Royal Institute of Public Health, Journal of the Royal United Service Institution, The Transvaal Medical Journal, Indian Medical Gazette.*

*Foreign: Archives de Médecine Navale, Revista de Sanidad militar y la Medicina militar Española, Giornale di Medicina militare, Bulletin de l'Institut Pasteur, Le Caducée, Der Militärärzt, Archiv für Schiffs- und Tropen-Hygiene, Archives de Médecine et de Pharmacie militaires, American Medicine, Bulletin of the Johns Hopkins Hospital, Norsk Tidskrift for Militærmedicin, Russian Medical Journal, Annali di Medicina Navale e Coloniale, Philippine Journal of Science.*

## MANAGER'S NOTICES.

The JOURNAL OF THE ROYAL ARMY MEDICAL CORPS is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

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# JOURNAL
OF THE
# ROYAL ARMY MEDICAL CORPS.

## Corps News.

November, 1908.

### ARMY MEDICAL SERVICE.—GAZETTE NOTIFICATIONS.

Colonel Charles A. Webb retires on retired pay, dated September 19, 1908. He entered the Service March 6, 1880; was promoted Surgeon-Major, Army Medical Staff, March 6, 1892; Lieutenant-Colonel, Royal Army Medical Corps, March 6, 1900; Lieutenant-Colonel, with increased pay under Art. 365, Pay Warrant, April 1, 1902 : Colonel, September 18, 1905. His war services are as follows: Nile Expedition, 1898, Battle of Khartoum. Despatches *London Gazette*, September 30, 1898. Egyptian medal with clasp. Medal.

### ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel Henry L. Battersby is placed on retired pay, dated September 7, 1908. He entered the Service March 6, 1880; was promoted Surgeon-Major, Army Medical Service, March 6, 1892, Lieutenant-Colonel, Royal Army Medical Corps, March 6, 1900. His war services are as follows: South African War, 1899-1900; Advance on Kimberley, including Actions at Belmont, Enslin, Modder River, and Magersfontein. In charge of a General Hospital (July and August, 1900). Afterwards on duty with Colonial Forces at Discharge Depôt, Operations in Orange River Colony, and in Cape Colony, South of Orange River, 1899-1900. Queen's Medal with 3 clasps.

Lieutenant-Colonel Arthur M. Davies is placed on retired pay, dated September 17, 1908. He entered the Service July 30, 1881; was promoted Surgeon-Major, Army Medical Service, July 30, 1893; Lieutenant-Colonel, Royal Army Medical Corps, July 30, 1901; Lieutenant-Colonel with increased pay under Art. 365, Pay Warrant, April 5, 1907. His war services are as follows. Egyptian Expedition, 1882-4, Medal, bronze star; Soudan Expedition, 1884, Battles of Teb and Tamai, 2 clasps; Soudan Expedition, 1884-5, Nile clasp.

Lieutenant-Colonel William B. Day, M.B., is placed on temporary half-pay on account of ill-health, dated September 30, 1908.

Major Lionel A. Mitchell is placed on temporary half-pay on account of ill-health, dated August 21, 1908.

Quartermaster and Honorary Captain Alexander Bruce, Royal Army Medical Corps, to be Honorary Major, dated September 23, 1908.

### ESTABLISHMENTS—ROYAL ARMY MEDICAL COLLEGE.

Lieutenant-Colonel Charles H. Melville, M.B., Royal Army Medical Corps, to be a Professor, *vice* Lieutenant-Colonel A. M. Davies, retired, dated September 17, 1908.

**EMBARKATIONS.**—Transport "Soudan," September 16, 1908. For North China: Major A. C. Fox; Lieutenants E. J. Elliot and J. C. Hart. For Straits Settlements:

Lieutenant-Colonel H. J. Wyatt and Captain H. S. Taylor. For Ceylon: Lieutenant-Colonel N. Manders, Majors F. A. Symons and A. J. MacDougall. For Hong Kong: Major P. J. Probyn, Captain B. A. Craig, Lieutenants W. J. E. Bell and H. M. J. Perry. Lieutenant-Colonel W. G. A. Bedford, C.M.G., Hong Kong, October 10, 1908.—Transport "Dongola," September 17, 1908. For India: Lieutenant-Colonel S. Powell; Lieutenants F. L. Bradish, C. W. Bowle. W. F. M. Loughnan, W. J. Thompson, J. du P. Langrishe, T. W. Browne, G. P. A. Bracken, C. Kelly, H. L. Howell, and J. A. Bennett. For Egypt: Lieutenant E. Gibbon.—Transport "Plassey," September 30, 1908. For India: Majors E. W. Slayter and M. P. C. Holt, D.S.O.; Captains L. E. L. Parker, J. D. G. Macpherson and B. Watts; Lieutenant B. Johnson. For Uganda on September 14, 1908: Colonel Sir David Bruce, C.B.; Captains A. E. Hamerton, D.S.O., and H. R. Bateman. For Malta, September 24, 1908: Lieutenant-Colonel A. F. Russell, C.M.G.; Captain M. H. Babington. For West Coast of Africa, October 1, 1908: Captains T. E. Fielding and A. M. MacLoughlin. October 10, 1908: Captain F. W. Cotton.

**ARRIVALS HOME.**—Tour expired. From India: Lieutenant-Colonel M. T. Yarr. From South Africa: Major H. W. H. O'Reilly; Captains J. E. H. Gatt and L. Addams-Williams. From South Africa: Lieutenant-Colonel F. H. M. Burton.

**ARRIVALS HOME ON LEAVE.**—From India: Lieutenant-Colonel H. J. R. Moberly (sick); Major F. R. Buswell; Captains E. J. N. Luxmoore, G. H. Richard, and A. C. Osburn (sick).

**APPOINTMENTS.**—Lieutenant-Colonel R. Porter as Administrative Medical Officer, Belfast District; Lieutenant-Colonel W. M. James (R.P.), charge Military Hospital, Guildford; Lieutenant-Colonel H. L. Battersby (R.P.), charge at Bull Point; Lieutenant-Colonel H. M. Sloggett, charge of Connaught Hospital, Aldershot; Captain C. H. Straton, Sanitary Officer, London District; Captain M. H. Babington, Specialist in Pathology, Malta; Captain J. Cowan, Specialist in Pathology, Royal Herbert Hospital; Lieutenant-Colonel C. G. D. Mosse (R.P.) to medical charge at Guernsey; Lieutenant-Colonel L. Haywood (R.P.) to medical charge at Lincoln; Major H. S. Peake (R.P.) to medical charge at Derby; Lieutenant-Colonel C. R. Woods (R.P.) transferred to Birr; Lieutenant-Colonel W. Rowney to be Recruiting Medical Officer at Manchester.

Colonel Sir J. R. A. Clark, Bt., C.B., R.A.M.C. Militia, has been appointed to the War Office for a period of two years to assist in the duties connected with the medical service of the Territorial Force.

Brevet-Lieutenant-Colonel W. B. Leishman has received an extension of one year in the appointment of Professor of Pathology at the R.A.M. College.

Captain C. R. Tichborne, R.A.M.C.(M.), has resigned the charge at Enniskillen.

**POSTINGS.**—Lieutenant-Colonel G. F. H. Marks, to Northern Command; Lieutenant-Colonel M. T. Yarr and Captain W. D. C. Kelly, to Aldershot Command; Major H. W. H. O'Reilly and Captain A. O. B. Wroughton, to Eastern Command; Captain J. E. H. Gatt, to Irish Command; Captain L. Addams-Williams, to Southern Command.

**TRANSFERS.**—Lieutenant J. B. Hanafin, from Aldershot, to Irish Command; Captain W. M. McLoughlin, from Western to London District; Captain C. H. Straton and Lieutenant A. C. H. Suhr from Eastern to London District.

**TRANSFERS TO HOME ESTABLISHMENTS.**—From India: Lieutenant-Colonels G. F. H. Marks and M. T. Yarr; Captains H. E. M. Douglas, V.C., D.S.O., A. O. B. Wroughton and W. D. C. Kelly.

**INCREASED PAY.**—Lieutenant-Colonel H. S. McGill has been selected for increased pay of that rank.

**EXCHANGES.**—Lieutenant-Colonel A. E. Tate and Major W. L. Gray; Majors R. F. E. Austin and M. P. Corkery.

**LIST OF CASUALTIES**:—

*Discharges.*—7859 Staff-Serjeant S. J. Phillips, September 30, 1908, after three months' notice; 8653 Staff-Serjeant A. Standage, October 3, 1908, medically unfit; 9224 Serjeant M. Sloper, September 15, 1908, with less than twenty-one years' service; 6424 Serjeant E. F. Shaw, September 30, 1908, after three months' notice; 6848 Staff-

Serjeant W. C. Hastings, October 14, 1908, after three months' notice; 6168 Lance-Corporal F. W. Davies, October 9, 1908, termination of second period; 7866 Private R. J. Millar, August 28, 1908, termination of second period; 12283 Private J. Irwin, September 14, 1908, termination of first period; 7885 Corporal C. A. Downes, September 12, 1908, termination of second period; 11304 Corporal W. F. Davies, September 22, 1908, termination of first period; 7909 Private A. Callender, September 28, 1908, termination of second period; 18814 Private F. Dellar, October 1, 1908, termination of first period; 1904 Private D. Carey, October 2, 1908, on payment of £10; 1991 Private C. A. Harper, October 2, 1908, on payment of £10; 17837 Private W. W. Drew, October 8, 1908, medically unfit.

*Transferred to Army Reserve.*—14542 Private C. P. Freame, September 10, 1908; 14558 Private T. W. Sumpter, August 14, 1908; 19825 Private H. Merryweather, September 8, 1908; 19832 Private C. E. Hitt, September 10, 1908; 19833 Private J. S. Ashborn, September 10, 1908; 19836 Private W. H. Crutch, September 13, 1908; 19839 Private H. B. Tilsed, September 12, 1908; 19840 Private A. E. Haynes, September 12, 1908; 19846 Private A. L. Cole, September 11, 1908; 19861 Private J. R. Williams, September 10, 1908; 1179 Private F. H. Collard, September 12, 1908; 1217 Private A. J. Payne, September 5, 1908; 1222 Private C. W. Dent, September 8, 1908; 1223 Private A. Suckling, September 8, 1908; 1224 Private T. G. Murlis, September 8, 1908; 1230 Private A. J. French, September 16, 1908; 1225 Private F. Adshead, September 10, 1908; 19831 Private R. C. Gale, September 10, 1908; 1221 Private R. H. Ward, September 8, 1908; 14570 Private J. McFarlane, September 14, 1908; 19848 Private W. J. Harwood, September 13, 1908; 1227 Private T. J. R. White, September 15, 1908; 1226 Private A. Powell, September 15, 1908; 1234 Private W. R. Hawkes, September 15, 1908; 1078 Private A. R. Feast, September 15, 1908; 1228 Private P. C. Smith, September 15, 1908; 19856 Private A. J. Dolder, September 17, 1908; 1238 Private A. Stratford, September 18, 1908; 1231 Private G. Sexton, September 19, 1908; 19481 Private F. C. Theobald, September 14, 1908; 19843 Private J. L. Weeks, September 17, 1908; 1241 Private W. G. Watson, September 19, 1908; 1237 Private W. Hellier, September 17, 1908; 14577 Private R. Hamilton, September 20. 1908; 1240 Private G. E. Townsend, September 19, 1908; 1254 Private E. G. Tizzard. September 19, 1908; 19867 Private W. S. Hughes, September 21, 1908; 19860 Private H. Cockhill, September 20, 1908; 1242 Private T. L. Greatorex, September 20, 1908; 1243 Private E. W. Hughes, September 20, 1908; 1244 Private A. F. Mason, September 20, 1908; 1245 Private H. Adams, September 22, 1908; 1259 Private W. Wright, September 23, 1908; 1246 Private G. Anderson, September 23, 1908; 1248 Private J. E. Stammers, September 23, 1908; 1250 Private J. McGuinn, September 23, 1908; 1251 Private W. T. M. Sweeting, September 23, 1908; 1262 Private H. Rowley, September 23, 1908; 1249 Private T. Marks, September 24, 1908; 19876 Private A. Thompson, September 25, 1908; 1267 Private J. J. Pierce, September 22, 1908; 19870 Private W. T. Kirkham, September 24, 1908; 19868 Private A. E. Harris, September 22, 1908; 1263 Private A. W. Bird, September 25, 1908; 1265 Private J. S. Ford, September 26, 1908; 1271 Private G. Phillips, September 30, 1908; 19876 Private M. Gray, September 26, 1908; 19891 Private J. J. Muston, September 28, 1908; 1264 Private R. J. Moore, September 30, 1908; 19890 Private F. T. Goodey, September 30, 1908; 1272 Private W. Jackson, October 2, 1908; 1273 Private W. Wilson, October 2, 1908; 1275 Private A. Smith, October 2, 1908; 1280 Private A. Allen, October 2, 1908; 1274 Private A. Herriott, October 2, 1908; 1308 Private J. Halford, October 3, 1908; 1284 Private H. R. Cowley, October 4, 1908; 1288 Private G. Challinor, October 6, 1908; 1289 Private W. Pickering, October 8, 1908; 1301 Private G. V. Hicks, October 9, 1908; 1292 Private G. H. Hall, October 7, 1908; 19906 Private S. Letchford, October 9, 1908; 1282 Private M. C. Saunders, October 6, 1908; 19903 Private G. A. T. West, October 7, 1908; 1313 Private J. Wigley, October 7, 1908; 1295 Private E. T. Morris, October 8, 1908; 1297 Private C. G. W. Johnson, October 9, 1908; 1294 Private W. E. Walton, October 8, 1908; 1296 Private J. H. Witt, October 9, 1908; 14616 Private A. H. Jones, October 7, 1908; 14623 Corporal S. Davidson, October 8, 1908; 1309 Private T. H. Walker, October 9, 1908; 1300 Private A. Rowlands, October 8, 1908; 1293 Private A. B. Stokes, October 8, 1908; 19912 Private A. W. Wise, October 10, 1908; 1287 Private H. Jones, October 6, 1908; 1299 Private G. H. Jackson, October 7, 1908; 1298 Private J. R. Barker, October 6, 1908; 1286 Private G. W. Barker, October 6, 1908; 1290 Private T. Randerson, October 7, 1908.

*Transfers from other Corps.*—10327 Serjeant J. C. Carder, September 19, 1908, from R.A.M.S. Militia, Belfast; 7015 Serjeant T. Haddon, September 24, 1908, from R.A.M.C.

Militia, Chatham; 18122 Corporal J. A. Kirby, September 24, 1908, from Egyptian Army; 1967 Private H. J. Nixon, August 31, 1908, from King's Royal Rifle Corps; 2028 Private J. Howard, October 1, 1908, from Liverpool Regiment.

*Transferred to other Corps.*—8883 Serjeant A. E. Fowler, August 19, 1908, to 2nd London Field Ambulance; 7662 Staff-Serjeant F. G. Payne, September 9, 1908, to 3rd West Lancashire Field Ambulance.

*Appointments.*—19591 Boy P. L. Rolfe, October 9, 1901. appointed Bugler; 1359 Boy W. N. Collier, October 9, 1908, appointed Bugler.

### THE FOLLOWING N.C.O.'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Quartermaster-Serjeant.*—8270 Staff-Serjeant F. L. M. Jones.

*For Staff-Serjeants.*—11841 Serjeant S. R. Holmes; 16264 Serjeant W. Harper; 10276 Serjeant F. Bird; 10059 Staff-Serjeant G. W. Carnell; 11761 Serjeant F. S. Walls; 10024 Serjeant G. Lampard; 11441 Serjeant H. Sprinks; 8977 Serjeant J. Sallis.

*For Serjeants.*—15591 Corporal J. Harris; 18678 Corporal L. S. Ellis; 10719 Lance-Serjeant W. H. Hopwood; 18933 Lance-Serjeant H. L. Thompson; 12129 Corporal S. M. Barnes; 11700 Corporal M. Stroud; 16231 Corporal H. B. Mason; 18420 Corporal A. J. Sanderson.

*For Corporals.*—18226 Private L. V. Bilbee; 19888 Private A. T. Pilgrim; 12384 Private T. W. Burnhill; 18984 Private B. Breeze; 18545 Private J. Douglas; 19453 Private A. C. Wingate; 19640 Private G. H. Hollands; 19010 Private B. J. Bull; 16292 Private J. Pegram; 18215 Private W. W. Dewey; 17964 Private W. Bowler; 17379 Private E. Hardy; 19160 Private C. J. Preston.

**NOTES FROM GUARDS DEPOT, CATERHAM.**—Surgeon-Major Whiston, Irish Guards, writes (October, 1908): "To the regret of all ranks at the Depôt, Staff-Serjeant J. Banks, R.A.M.C., left on September 16 for Egypt, after having been here for four years. Before leaving, he was presented with a calabash pipe and a gold-mounted walking-stick, bearing the following inscription, 'To Staff-Serjeant Banks from W.O.'s, Staff and Pay Serjeants, Guards Depot. Lest we forget."

**NOTES FROM MALTA.**—Major C. E. Pollock writes (October 12, 1908): "On October 8, 1908, the Officers of the Royal Army Medical Corps, Malta, held a dinner at the Union Club for the purpose of bidding farewell to Lieutenant Colonel R. Jennings, who is leaving the island, and of welcoming Lieutenant-Colonel A. F. Russell, C.M.G., and Captain M. H. Babington, who have just arrived. Twenty-four officers and guests sat down to an excellent dinner. Colonel J. G. MacNeece, our Principal Medical Officer, proposed Lieutenant-Colonel Jennings' health, which was drunk with musical honours. Lieutenant-Colonel Jennings having responded, Lieutenant-Colonel Rhodes proposed the health of the new arrivals. Bridge and snooker filled a very pleasant evening, in spite of the sadness which everyone naturally felt at losing Lieutenant-Colonel Jennings from our midst. Current items of interest are the possibility of increased local allowances, the arrival of the cold weather and migratory inhabitants, and to a slight extent Near Eastern politics.

"Extract from the *Daily Malta Chronicle*, October 12, 1908: 'Among the conventional gatherings, so numerous of late, ordinarily associated with those changes in the *personnel* of the garrison which wait upon the exigencies of the service, it will have been difficult to exceed the heartiness and liberality which characterised the "Supper and Social" given on Friday evening, by the N.C.O.'s of No. 30 Company, Royal Army Medical Corps, to their arriving and departing comrades. The function, which took place in the Dining Hall of the Military Hospital, Valletta, which was profusely decorated for the occasion, was of especial interest, for while the proceedings were brightened by the presence of a very welcome arrival, in the presence of Quartermaster Serjeant Gillespie, R.A.M.C., there was evidence of the regret awakened by the approaching departure of so many good comrades, namely: Serjeant-Major Lowe, Staff-Serjeant Underwood, Serjeant Jarvis and Serjeant Davis, of whom the latter left on Saturday."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, Secretary to the Principal Medical Officer, His Majesty's Forces in India, writes (September 17, 1908):—

"*Appointments.*—Captain F. J. Garland, 6th (Poona) Division, has been detailed for service at Aden, in place of Captain A. A. Meaden, 5th (Mhow) Division, to relieve Captain C. H. Carr, and sail by 5th transport 'Rohilla,' December 3, 1908, from Bombay.

"The following officers are appointed Trooping Medical Officers for duty in connection with embarkation and disembarkation of troops and invalids during the season 1908-9:—

"Karachi—Major R. C. Thacker.

"Bombay—Major H. E. Winter.

"The following officer has been appointed Honorary Surgeon to His Excellency the Viceroy: Captain C. A. J. A. Balck.

"*Leave.*—Major L. A. Mitchell is granted extension of medical certificate leave ex India, from August 21 to November 20, 1908.

"*Postings.*—The following officers arriving on 'Rohilla' on September 24, 1908, are posted as follows:—

"Lieutenants E. M. Middleton and A. C. Elliott to 2nd (Rawal Pindi) Division, first proceeding to Rawal Pindi to undergo one month's instruction in sanitation.

"Lieutenant T. H. Scott, to 3rd (Lahore) Division, first proceeding to Rawal Pindi to undergo one month's instruction in sanitation.

"Lieutenant J. J. O'Keeffe to 4th (Quetta) Division, to undergo one month's instruction in sanitation at Divisional Headquarters.

"Major S. W. Sweetnam to 6th (Poona) Division.

"Lieutenants E. C. Phelan, F. Casement and C. H. Denyer, to 8th (Lucknow) Division, first proceeding to Lucknow to undergo one month's instruction in sanitation.

"Lieutenants H. W. Farebrother and G. F. Rudkin to 9th (Secunderabad) Division, first proceeding to Bangalore to undergo one month's instruction in sanitation.

"Lieutenant W. B. Purdon to Burma, first proceeding to Bangalore to undergo one month's instruction in sanitation.

"*Specialists.*—The following officers are appointed Specialists in (*c*) Advanced Operative Surgery, with effect from the dates of their joining their respective Divisions:—

"3rd (Lahore) Division—Lieutenant G. de la Cour.

"8th (Lucknow) Division—Lieutenant C. G. Browne.

"*Transports.*—Major F. W. Begbie, tour expired, will proceed home in 11th transport 'Plassey' instead of 9th transport."

**NOTES FROM MHOW, CENTRAL INDIA.**—Major F. W. Begbie writes (October, 1908): "Since my last letter in January, there have been several changes amongst members of the Corps in this station. On February 8, Colonel Williamson, C.B., C.M.G., our Principal Medical Officer, retired from the Service, and was succeeded by Colonel Henderson, I.M.S., late Principal Medical Officer in Aden. During the same month, Captain Pallant, well known for his equestrian abilities, joined us from Jubbulpore. On the outbreak of the Frontier War in April, Captain (now Major) Hudleston and Captain Pallant were sent to the front, and most worthily upheld the reputation of the Mhow detachment of the Corps. With the advent of the hot weather Lieutenant-Colonel Westcott and family departed for Naini Tal, and the *Pioneer* letter from that station informed the world that they were well to the fore in all the sporting and social events of the season.

"On June 12, to our great regret, Colonel Henderson was forced to resign his appointment, owing to ill-health, and left the station for England, Lieutenant-Colonel Elkington, our Sanitary Officer, in the absence of the Senior Medical Officer, acting for him. At the close of May, Lieutenant-Colonel Westcott returned, and at once directed his energies to enteric and malarial prevention, with the result that the garrison has been singularly free from both of those diseases this season.

"On the close of the short Frontier War, Major Hudleston returned, and at once flew off to meet his bride at Ootacamund, where the wedding took place. Mrs. Hudleston is a great addition to the social and athletic community of the station, being a well-known tennis, golf, and swimming champion.

"During the rains a most interesting series of lectures on 'Sanitation Up to Date' were delivered by Lieutenant-Colonel Elkington, before the General and all the officers of the station. Another noteworthy feature of the year has been the formation of a Medical Society by all the medical officers of the station, under the presidency of the Senior Medical Officer. The Society meets once weekly, and many valuable papers have been read and discussed. The Section Hospital has been much improved by the building of an up-to-date operating theatre and a new officers' ward. On August 16, Colonel O'Sullivan, well known throughout the Corps, joined the station as divisional Principal Medical Officer, *vice* Colonel Henderson, I.M.S., retired. Early in October, Lieutenant Robinson, our champion football player, proceeded to Debra Dun, to qualify as X-ray Specialist. Captain Coates, following the example of Major Hudleston, rushed off to Bombay to enter into the bonds of matrimony on the 6th of the same month.

"'The Carbineers' proceeded to South Africa, being relieved by the Inniskilling Dragoons from Cairo. Lieutenant Langrish, R.A.M.C., is expected shortly, as Enteric Specialist, this work having been performed heretofore by Lieutenant Dawson, our Venereal Specialist. With the close of the trooping season Major Begbie and Captain Coates proceed to England, tour expired."

**NOTES FROM WYNBERG.**—Serjeant-Major C. W. Kinsella, 22nd Company, R.A.M.C., writes: "Miss A. Garriock, R.R.C., Principal Matron, is now quite convalescent, and awaiting passage home. Miss A. Hutton-Potts arrived from England on Sunday last, and will probably relieve Miss A. L. Cox, who will proceed up country. Major and Quartermaster Merritt, with Mrs. and Miss Merritt, have been very busy lately in the cause of charity. Miss Miriam Merritt scored great success in the arranging of a concert and dance at Amberd, her parents' pretty residence at Kenilworth. It was in aid of the Seamen's Institute. Both affairs were attended by large and fashionable gatherings. The concert took place in the afternoon, and the performers, in addition to Miss Merritt, who sings delighfully, were Mrs. Forsyth, Madam Apolline Niay, Miss Morriss, Miss Muriel Hart, Miss W. Newmann Thomas, Miss Juta, Miss MacIntyre, and Mr. H. Gers. Tea was nicely served in the interval, and altogether the entertainment was well carried out. The dance took place at Amberd on the same evening, and it was attended with similar success. The tickets were privately sold, therefore both entertainments were quite like private functions. Dancing took place in the drawing-room and dining-room, and refreshments were served in another spacious apartment. Marquees were erected in the grounds for sitters-out, and these and the awned-in verandah were gaily decorated with flags and palms.

"Lieutenant-Colonel Heffernan, Senior Medical Officer, Captain Dawson, and the Cape Town Detachment, 22nd Company, rendered first aid to the men injured at the Cape Town explosion. The following letter was addressed to the Administrative Medical Officer, Cape Colony, and published in orders:—

"'CAPE GOVERNMENT RAILWAYS.

"'*From*
"'Electrical Engineer,
"'Cape Town.

*To the*
Principal Medical Officer,
The Castle, Cape Town.

"'*September* 18, 1908.

"'DEAR SIR,—I beg to tender you and your staff my very sincere thanks for the prompt and invaluable assistance rendered to us yesterday at the time of the boiler explosion. The immediate presence of qualified medical men relieved me of much worry and anxiety at a critical moment, and enormously enhanced the chances of recovery of the injured men. My staff and I appreciate your kindly action, and wish to place on record an expression of our gratitude.

"'Yours faithfully,
"'(*Signed*) J. DENHAM,
"'*Electrical Engineer.*'

"The Administrative Medical Officer, Cape Colony, also notifies that the General Officer Commanding, Cape Colony, has been pleased to express his satisfaction at the prompt services rendered by the Corps.

"Major W. E. Hardy has joined from Pretoria, *vice* Lieutenant W. H. Forsyth, transferred to Middelburg.

"Thanks to the action of Lieutenant-Colonel Hickson, Officer Commanding, a grant of £25 has been obtained from the South African Garrison Institutes to furnish the patients' recreation-room, which now presents a most comfortable appearance.

"Surgeon-General W. W. Kenny, A.M.S., Principal Medical Officer, South Africa, inspected the hospital, barrack-rooms, &c., last week, and Major-General Sir R. Hart, V.C., &c., General Officer Commanding, Cape Colony, did so a few days later, both officers expressing their satisfaction at the state of affairs."

## ROYAL ARMY MEDICAL CORPS (MILITIA).

Captain William V. Sinclair is granted the honorary rank of Major, dated August 14, 1908.

## ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Captain George G. Oakley to be Surgeon-Major, dated September 2, 1908.

Surgeon-Major Joseph Adams, M.D., to be Surgeon-Lieutenant-Colonel, dated September 22, 1908.

## MILITIA.

*3rd Battalion the King's (Shropshire Light Infantry).*—Surgeon-Lieutenant-Colonel H. N. Edwards retires, with permission to retain his rank and to wear the prescribed uniform, dated May 15, 1908.

## IMPERIAL YEOMANRY.

*Berks.*—Surgeon-Major John H. Waters, M.D., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

## SPECIAL RESERVE.

The undermentioned officers, having assented to be transferred, are appointed officers of the Special Reserve of Officers from the date stated, retaining the rank and seniority which they held while in the Militia:—

*The Durham Royal Field Artillery, from the Durham Royal Garrison Artillery (Militia).*—Surgeon-Lieutenant-Colonel James Rawlings, dated July 5, 1908.

*4th Battalion the East Surrey Regiment.*—Surgeon-Lieutenant-Colonel M. O. Coleman, M.D., dated September 6, 1908.

## TERRITORIAL FORCE. ROYAL ARMY MEDICAL CORPS.

*2nd East Anglian Field Ambulance.*—Supernumerary Surgeon-Major John Herbert Stacy, from the 1st Volunteer Battalion, The Norfolk Regiment, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major Samuel John James Kirby, M.D., from the 2nd Volunteer Battalion the Norfolk Regiment, to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Supernumerary Surgeon-Captain George Blake Masson, from the 3rd Volunteer Battalion the Norfolk Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Supernumerary Surgeon-Captain James Morrison Gardiner Bremner, M.B., from the 1st Volunteer Battalion the Norfolk Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

William Thomas Blazeby to be Quartermaster with the honorary rank of Lieutenant, dated May 6, 1908.

*1st Home Counties Field Ambulance.*—Major Charles Pye Oliver, M.D., from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

The undermentioned officers, from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), are appointed to the Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain John Monkhouse Rogers-Tilstone.
Lieutenant John Aldington Gibb.
Lieutenant Joseph Ward.
Lieutenant Arthur Thomas Falwasser.
Quartermaster and Honorary Lieutenant Bernard Dalby Hobson.

Supernumerary Surgeon-Captain William James Woodman, from the 4th Volunteer Battalion the Queen's Own (Royal West Kent Regiment), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant James Stratton Warrack, M.D., from the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Harry Tom Sargeant Cory to be Quartermaster, with the honorary rank of Lieutenant, dated July 7, 1908.

*3rd Home Counties Field Ambulance.*—The undermentioned officers, from the East Surrey Bearer Company, Royal Army Medical Corps (Volunteers), are appointed to the Ambulance, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain George Alfred Edsell, M.D.
Lieutenant John Alexander Preston.

Quartermaster and Honorary Captain Alexander Finlay, retired pay (late Royal Army Medical Corps), to be Quartermaster, with the honorary rank of Captain, dated April 1, 1908.

*3rd Lowland Field Ambulance.*—Major Alexander Macdonald, M.B. (since deceased), from the 1st Lothian Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Captain Alexander Aitken Ross, M.B., from the 1st Lothian Bearer Company. Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

The undermentioned officers, from the 1st Edinburgh (City) Royal Garrison Artillery (Volunteers), are appointed to the Ambulance, with precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Alexander Morrison McIntosh, M.B.

Surgeon-Lieutenant James Hunter Harvey Pirie.

The undermentioned officers, from the Queen's Rifle Volunteer Brigade, the Royal Scots (Lothian Regiment), to be Lieutenants, with precedence as in the Volunteer Force, April 1, 1908:—

Surgeon-Lieutenant John Dixon Comrie.

Surgeon-Lieutenant Harry Alfred Leebody, M.B.

Surgeon-Lieutenant John William Keay, M.D.

Surgeon-Lieutenant John D. Comrie to be Captain, dated June 3, 1908.

*1st North Midland Field Ambulance.*—Thomas Ashby Barron to be Lieutenant, dated July 10, 1908.

*3rd North Midland Field Ambulance.*—Charles Henry Bullen to be Lieutenant, dated July 24, 1908.

*1st West Riding Field Ambulance.*—Charles Thomas Ross to be Quartermaster, with the honorary rank of Lieutenant, dated July 9, 1908

*2nd West Riding Field Ambulance.*—Charles William Eames, M.D., to be Lieutenant, dated July 1, 1908.

*2nd Wessex Field Ambulance.*—Lieutenant Alfred Bertram Soltau, M.D., from the Devon Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, dated April 1, 1908.

Lieutenant Alfred B. Soltau, M.D , to be Captain, dated April 8, 1908.

Captain Alfred B. Soltau, M D., to be Major.

Edward Revely Clarke, M.B., to be Lieutenant, dated June 25, 1908.

Charles Rowland Crowther, M.B., to be Lieutenant, dated June 25, 1908.

George Hope Warren to be Lieutenant, dated June 25, 1908

Fielding Charles Whitmore to be Lieutenant, dated June 25, 1908.

William Blackwood, M.B., to be Lieutenant, dated June 25, 1908.

George Salter Garland to be Quartermaster, with the honorary rank of Lieutenant, dated June 25, 1908.

*2nd Eastern General Hospital.*—Major Charles John Jacomb-Hood, from the Sussex and Kent Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Captain James Augustus Rooth, from the Sussex and Kent Bearer Company, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Captain and Honorary Major Theodore Francis Heathfield Briscoe (late 4th Volunteer Battalion), the Royal Fusiliers (City of London Regiment), from the Retired List, to be Quartermaster, with the honorary rank of Major, relinquishing the substantive rank of Captain, dated April 27, 1908.

The undermentioned to be officers whose services will be available on mobilisation, dated April 27, 1908:—

To be Lieutenant-Colonels:—Henry Seymour Branfoot, M.B.; Thomas Jenner Verrall; Edmund Hobhouse, M.D.; Reginald Francis Jowers, F.R.C.S.Eng.

To be Majors:—Edward Forster Maynard, M.D.; Frederick John Paley, M.D.; Walter Broadbent, M.D.: William Watson Griffin, M.B., F.R.C.S.; Donald George Hall, M.D.; Arthur Herbert Buck, F.R.C.S.Edin.; Charles Frederick Bailey, M.D.; Theodore Henry Ionides, M.B., F.R.C.S.

To be Captains:—Frank George Bushnell, M.D.; Walter Andrew Bowring, F.R.C.S.; Richard Whittington, M.D.; William Herbert Brailey, M.B.; William Dobree Calvert; Henry Herbert Taylor, F.R.C.S.; Henry Gervis, M.B.; George Morgan, F.R.C.S.Edin.; Charles Henry Benham, M.D.; Leonard Arthur Parry, M.D., F.R.C.S.; Arthur Maurice Colcutt, M.B.; Robert Sanderson, M.B.; Joseph Shardlow, M.B.; Arthur Jaffray Hutchinson, M.B.; Charles Nugent Chadborn: Arthur Geoffrey Bate, M.B., F.R.C.S.Edin.; Morris Notley John Rigby; Arthur Mantell Daldy, M.D.; Ryder Percival Nash; Walter Robert Wood.

*1st Scottish General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated June 27, 1908:—

To be Lieutenant-Colonels: John Gordon, M.D.; James Mackenzie Booth, M.D.; James John Young Dalgarno, M.B.; John Marnock, M.B.

To be Majors: Robert Gordon McKerron, M.D.; Henry McIlree Williamson Gray, M.B., F.R.C.S.Edin.; George Gibb, M.B.; George Rose, M.B.; Alexander Rudolf Galloway, M.B.: Charles Howard Usher, M.B., F.R.C.S.Edin.; William Rattray Pirie. M.B.; David Watson Geddie, M.B.

To be Captains: John Reid Levack, M.B.; Henry Peterkin, M.B.; James Melville Paterson Crombie, M.B.

*2nd Scottish General Hospital.*—Lieutenant-Colonel Frank Wyville Thomson, M.B. (late Indian Medical Service), to be Lieutenant-Colonel, dated July 21, 1908.

*1st Western General Hospital, Royal Army Medical Corps.*—Nathan Raw, M.D., F.R.C.S.Edin., to be Lieutenant-Colonel, dated July 7, 1908

Archibald Burns Gemmel to be Major, dated July 7, 1908.

*Sanitary Service.*—Frederick Mann Williams (late Lieutenant), 2nd (Prince of Wales' (Volunteer Battalion the Devonshire Regiment, to be Lieutenant-Colonel, dated July 28, 1908.

The undermentioned officers, from the Volunteer Force, are appointed to the Corps, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

To be Lieutenant-Colonels: Supernumerary Surgeon-Lieutenant-Colonel (Honorary Lieutenant-Colonel in the Army) James Duncan, M.B., from the 3rd Volunteer Battalion the Manchester Regiment. Supernumerary Surgeon-Lieutenant-Colonel Frederic Joseph Knowles, from the 2nd Volunteer Battalion the Prince of Wales' Volunteers (South Lancashire Regiment). Surgeon-Lieutenant-Colonel Thomas Moore Dawson, from the 1st Lancashire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant-Colonel George Hollies, M.D., from the 2nd Volunteer Battalion the King's (Shropshire Light Infantry). Surgeon-Lieutenant-Colonel (Honorary Major in the Army) Andrew Alexander Watson, from the 2nd Volunteer Battalion the East Lancashire Regiment.

To be Majors. Surgeon-Major Charles Averill, M.D., from the 5th Volunteer Battalion the Cheshire Regiment. Surgeon-Major John Tatham Thompson, M.B., from the 3rd Volunteer Battalion the Welsh Regiment. Surgeon-Major John William Ellis, from the 6th Volunteer Battalion the King's (Liverpool Regiment). Surgeon-Major Ernest Wykeham Barnes, from the 6th Volunteer Battalion the King's (Liverpool Regiment). Surgeon-Major Henry Christopher Lamport, M.B., from the 5th Lancashire Royal Garrison Artillery (Volunteers). Surgeon-Major James Arthur Rigby, M.D., from the 5th Lancashire Royal Garrison Artillery (Volunteers). Surgeon-Major William Fitzwilliam O'Grady, from the 1st Volunteer Battalion the Manchester Regiment. Surgeon-Major Stephen Nesfield, from the 5th (Ardwick) Volunteer Battalion the Manchester Regiment Surgeon-Major Robert Jackson, M.B., from the 2nd Lancashire Royal Engineers (Volunteers). Surgeon-Major Thomas Stevenson, M.B., from the 2nd Lancashire Royal Garrison Artillery (Volunteers).

To be Captains: Surgeon-Captain John Howard-Jones, M.B., from the 4th Volunteer Battalion the South Wales Borderers. Surgeon-Captain Charles Evan Humphreys, from the 5th Volunteer Battalion the South Wales Borderers. Surgeon-Captain Albert Hilton, from the 3rd Volunteer Battalion the Manchester Regiment. Surgeon-Captain Henry D'Arnim Blumberg, from the 3rd Volunteer Battalion the King's (Liverpool Regiment). Surgeon-Captain Elisha Hodkinson Monks, from the 2nd Lancashire Royal Engineers (Volunteers). Surgeon-Captain Charles William Crawshaw, M.B., from the 2nd Volunteer Battalion the East Lancashire Regiment. Surgeon-Captain Arthur Price, from the 4th Battalion the King's (Liverpool Regiment). Surgeon-Captain Alan Young Greenwood, M.B., from the 3rd Lancashire Royal Garrison Artillery (Volunteers). Surgeon-Captain (Honorary Lieutenant in the Army) Michael Joseph Mahoney, M.B., from the 6th Volunteer Battalion the King's (Liverpool Regiment).

To be Lieutenants: Surgeon-Lieutenant Harry Armitage Robinson, M.D., from the 2nd Lancashire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Arthur Henry Falkner, from the 2nd Volunteer Battalion the King's Own (Royal Lancaster Regiment). Surgeon-Lieutenant Frederick James Green, M.D., from the Duke of Lancaster's Own Imperial Yeomanry. Surgeon-Lieutenant Howard Henry, M.D., from the 1st Volunteer Battalion the East Lancashire Regiment. Surgeon-Lieutenant Douglas Catterall Leyland Orton, from the 2nd Volunteer Battalion the Prince of Wales's Volunteers (South Lancashire Regiment). Surgeon-Lieutenant-Samuel English, M.B., from the 3rd Lancashire Royal Engineers (Volunteers). Surgeon-Lieutenant Samuel Edward Rigg, from the 1st Cumberland Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Charles Botterill Baxter, M.B., from the 2nd Volunteer Battalion the King's (Shropshire Light Infantry). Surgeon-Lieutenant

Andrew Edward Hodder, M.B., from the 1st Volunteer Battalion the Manchester Regiment.

## ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel and Honorary Colonel Francis Lawrance Stephenson, C.B., M.B., from the Honorary Colonelcy of the Eastern Command, Woolwich Companies, Royal Army Medical Corps (Volunteers), is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the 2nd London Territorial Division, with precedence as in the Volunteer Force, dated April 1, 1908.

*1st South Midland Mounted Brigade Field Ambulance.*—William Henderson Stephen, M.B., to be Captain, dated July 31, 1908.

Thomas Henderson Forrest, M.B., to be Lieutenant, dated July 31, 1908.

*3rd East Anglian Field Ambulance.*—Surgeon-Captain Daniel Mowat, M.D., from the 3rd Volunteer Battalion the Essex Regiment, to be Major, dated April 1, 1908.

Surgeon-Captain Josiah Oldfield, M.D., from the 1st Volunteer Battalion the Essex Regiment, to be Captain, dated April 1, 1908.

Leslie Henry Beamand is appointed Quartermaster, with the honorary rank of Lieutenant, dated June 5, 1908.

*2nd Home Counties Field Ambulance* Lieutenant Albert Richard Hencbley, M.D., from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), to be Major, dated April 1, 1908.

Lieutenant William Henry Flint, from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Quartermaster and Honorary Lieutenant George Edmund Barford, from the Eastern Command, Maidstone Companies, Royal Army Medical Corps (Volunteers), is appointed Transport Officer, with the honorary rank of Lieutenant, dated April 1, 1908.

Herbert Stanley Hollis to be Lieutenant, dated April 27, 1908.

David Livingston Hamilton (late Surgeon-Lieutenant, 4th Volunteer Battalion the Manchester Regiment) to be Lieutenant, dated May 5, 1908.

Raby Montague Grogono to be Lieutenant, dated May 5, 1908.

Ernest John Thurgar is appointed Quartermaster, with the honorary rank of Lieutenant, dated May 5, 1908.

*3rd London Field Ambulance.*—Quartermaster and Honorary Captain James W. Bennett is granted the honorary rank of Major, dated August 31, 1908.

*1st West Riding Field Ambulance.*—James Mackinnon to be Lieutenant, dated April 1, 1908.

*3rd Wessex Field Ambulance.*—Alexander Milne-Thomson (late Surgeon-Major, the 9th New Zealand Mounted Rifles, South African Field Force), to be Lieutenant, dated July 6, 1908.

*1st London General Hospital Royal Army Medical Corps.*—The undermentioned to be officers whose services will be available on mobilisation, dated July 31, 1908 :—

To be Lieutenant-Colonels :—Norman Moore, M.D. ; William Harrison Cripps, F.R.C.S.Eng. ; Samuel West, M.D. ; William Bruce Clarke, M.B. ; F.R.C.S.Eng.

To be Majors : Joseph Arderne Ormerod, M.D. ; Anthony Alfred Bowlby, C.M.G., F.R.C.S.Eng. ; Wilmot Parker Herringham, M.D. ; Charles Barrett Lockwood, F.R.C.S.Eng. ; Howard Henry Tooth, C.M.G., M.D. ; D'Arcy Power, M.B., F.R.C.S.Eng. ; Archibald Edward Garrod, M.D. ; Holburt Jacob Waring, M.B., F.R.C.S. Eng.

To be Captains : James Calvert, M.D. ; William McAdam Eccles, M.B., F.R.C.S. Eng. ; Herbert Morley Fletcher, M.D. ; Robert Cozens Bailey, M.B., F.R.C.S.Eng. ; John Hannah Drysdale, M.D. ; Louis Bathe Rawling, M.B., F.R.C.S.Eng. ; Percival Horton-Smith-Hartley, M.V.O., M.D. ; George Ernest Cask, F.R.C.S.Eng.

*5th Northern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated September 30, 1908 :—

To be Lieutenant Colonels : Frank Montague Pope, M.D. ; George Cooper Franklin, F.R.C.S.Eng. ; Reginald Pratt, M.D. ; Claude Douglas, F.R.C.S.Eng.

To be Majors : Astley Vavasour Clarke, M.D. ; Robert Sevestre, M.D. ; Thomas Villiers Crosby, M.D. ; John Thomas Horron Davies, M.D. ; Henry John Blakesley, F.R.C.S.Eng. ; Cecil Edward Marriott, M.B., F.R.C.S.Eng. ; John Stretton Sloane, M.B., F.R.C.S.Eng. ; James Duncan Slight, M.D.

To be Captains : Robert Stewart, M.D. ; Joseph Edward Waite, M.B. ; Felix Bolton Carter, M.D., F.R.C.S.Eng. ; Ernest Lewis Lilley, M.B., F.R.C.S.Eng. ;

Richard Milbourne West, M.D.; Robert Robertson Young, M.D.; James Williamson Patrick, M.D.; Edgar Vaughan Phillips; Sydney Frederick Smith; Ralph Michell; Leonard Erasmus Ellis, M.D.; Frederick William Bennett, M.D.; Robert Wallace Wesley Henry, M.D.; Louis Kenneth Harrison, M.B.; Wilfred Ernest Gibbons, M.D.; Robert Hilton Fagge; Robert Basil Stamford, F.R.C.S.Edin.; William Moffat Holmes, M.B.

*3rd Scottish General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated July 3, 1908:—

To be Lieutenant-Colonels: Sir Hector Clare Cameron, M.D.; Samson Gemmell, M.D.; Ralph Stockman, M.D.; Robert Muir, M.D.

To be Majors: Thomas Kennedy Dalziel, M.B.; Henry Rutherfurd, M.B.; James Henderson Nicoll, M.B.: Walter King Hunter, M D.; John Marshall Cowan, M.D.; James Walker Downie, M.B.; Andrew Maitland Ramsay, M.D.; Duncan Macartney, M.D.

To be Captains: William MacLennan, M.B.; James Laurie, M.B.; Robert Barclay Ness, M.B.; John McCubbin Johnston, M.D.; James Carslaw, M.B.; John Towart; John Morton, M.B.; Alfred Alexander Young, M.B.; William Walls Christie, M.D.; Alexander MacLennan, M.B.; Ernest George Fortune, M.B.; James Campbell McClure, M.B.; Robert Fullarton, M.B.; John Gilchrist, M.D.; Alexander Henry Edwards, M.B, F.R.C.S.Edin.; Mathew Logan Taylor, M B.; John Gracie, M.B.; Leonard Findlay, M.D.; Charles Campbell Cuthbert, M.D.; Archibald Wilson Harrington, M.D.

*4th Scottish General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated July 3, 1908:

To be Lieutenant-Colonels: Alexander Napier, M.D.; James Crawford Renton, M.D.; John Barlow, M.D., F.R.C.S.Eng.; George Stevenson Middleton, M.D.

To be Majors: Robert Henry Parry, F.R.C.S.Edin.; James Hogarth Pringle, M.B., F.R.C.S.Edin.; Thomas Kirkpatrick Monro, M.D.; James Grant Andrew, M.B.; John Binnie McKenzie Anderson, M.B.; Andrew Freeland Fergus, M.D.; James Kerr Love, M.D.; David Couper, M.D.

To be Captains: James Hamilton, M.B.; Andrew Nicholson McGregor, M.D.; Adam Brown Kelly, M.D.; Andrew Stewart Tindal, M.D.; Douglas Wills Russell, M.B.; David Lamb, M.B.; James Maclean, M.B., George Burnside Buchanan, M.B.; Hugh Walker, M.B.; Farquhar Macrae, M.B.; Edward Mackay, M.B.; James Weir, M.B.; John Allan Craigie Macewan, M.B.; James Donald Holmes, M.B.; John Henderson, M.D.; John Robert Chalmers, M.B.; Alexander Fraser, M.B.; David Fyfe, F.R.C.S.Edin.; John Stoddart Barr, M.B.; Joseph Goodwin Tomkinson, M.D.

*1st Southern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated July 3, 1908:—

To be Lieutenant-Colonels: Robert Saundby, M.D.; Harry Gilbert Barling, F.R.C.S.Eng.; Arthur Foxwell, M.D.; Frank Marsh, F.R.C.S.Eng.

To be Majors: Robert Michael Simon, M.D.; William Frederick Haslam, F.R.C.S.Eng.; Otto Jackson Kauffman, M.D.; James Thomas Jackman Morrison, F.R.C.S.Eng.; Thomas Sydney Short, M.D.; Harry Eales, John Douglas Stanley, M.D.; Charles Albert Leedham-Green, M.D., F.R.C.S.Eng.

To be Captains: James William Russell, M.D.; George Heaton, F.R.C.S.Eng.; Joseph George Emmanuel, M.D.; William Billington, F.R.C.S.Eng.; Arthur Stanley Barnes, M.D.; Albert Lucas, F.R.C.S.Eng.; Leonard George Joseph Mackey, M.D.; Leonard Parker Gamgee, F.R.C.S.Eng.; William Henry Wynn, M.D.; Frederick Victor Milward, F.R.C.S.Eng.; Frank Barnes, F.R.C.S.Eng.; James Martin Young, M.B.; Walter James Clarke.

*2nd Southern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated September 30, 1908:—

To be Lieutenant-Colonels: Robert Shingleton Smith, M.D.; Edmund Comer Board; John Michael Clark, M.D.; George Munro Smith.

To be Majors: Arthur Bancks Prowse, M.D., F.R.C.S.Eng.; James Swain, M.D., F.R.C.S.Eng.; George Parker, M.D.; Charles Alexander Morton, F.R.C.S.Eng.; Patrick Watson Williams, M.D.; Robert Guthrie Poole Lansdown, M.D.; Cyril Hutchinson Walker, M.B., F.R.C.S.Eng.; William Robert Ackland.

To be Captains: Francis Henry Edgeworth, M.B.; John Lacy Firth, M.D., F.R.C.S.Eng.; John Odery Symes, M.D.; Thomas Carwardine, M.B., F.R.C.S.Eng.; James Taylor; Henry Greville Kyle, M.B.; Carey Franklin Coombs, M.D.; Harold Frederick Mole, F.R.C.S.Eng.; Edward Cecil Williams, M.B.; Ernest William Hey Groves, M.D., F.R.C.S.Eng.; John Matthew Fortescue-Brickdale, M.D.; Edward

Hugh Edwards Stack, M.B., F.R.C.S.Eng.; John Freeman, M.D., F.R.C.S.Edin.; John Dacre; Joseph John Scammell Lucas, M.D.; Herbert Elwin Harris, M.B., F.R.C.S.Eng.; William Cotton, M.D.; Hedley Hill, M.D.; William Stuart Vernon Stock, M.B.

*5th Southern General Hospital.*—Surgeon-Major Bonner Harris Mumby, M.D., from the 3rd (Duke of Connaught's Own) Volunteer Battalion, the Hampshire Regiment, to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

John Wallace Kemp to be Quartermaster, with the honorary rank of Lieutenant, dated July 22, 1908.

*2nd Western General Hospital.*—Quartermaster and Honorary Lieutenant Sydney Workman, from the Western Command, Manchester Company, Royal Army Medical Corps (Volunteers), to be appointed Quartermaster, with precedence as in the Volunteer Force, dated April 1, 1908.

George Arthur Wright, M.B., F.R.C.S., to be Lieutenant-Colonel, dated July 2, 1908.

Captain and Honorary Major William Thorburn, M.D., F.R.C.S. (late 2nd Volunteer Battalion the Manchester Regiment), from the Retired List, to be Major, dated July 2, 1908.

The undermentioned to be officers whose services will be available on mobilisation, dated July 2, 1908:—

To be Lieutenant-Colonels: Graham Steell, M.D.; Frederick Armitage Southam, M.B., F.R.C.S.Eng.; Abraham Matthewson Edge, M.D.; Alfred Harry Young, M.B., F.R.C.S.Eng.

To be Majors: Edmund Taylor Milner, M.B.; Judson Sykes Bury, M.D.; James Niven, M.B.; John Edward Platt, M.D., F.R.C.S.Eng.; Alexander Hill Griffith, M.D., F.R.C.S.Edin.; Ernest Septimus Reynolds, M.D.; William Milligan, M.D.; Robert Briggs Wild, M.D.

To be Captains: Alexander Wilson, F.R.C.S.Eng; James Lorrain Smith, M.D.; Arthur Henry Burgess, M.B,, F.R.C.S.Eng.; Henry Richmond Hutton, M.B.: John Howson Ray, M.B., F.R.C.S.Eng.; Richard Thomas Williamson, M.D.; Evelyn Davison Telford, F.R.C.S.Eng.: Ernest Nicholson Cunliffe, M.D.; Philip Roscoe Wrigley, F.R.C.S.Eng.; Charles Herbert Melland, M.D.; William James Storey Bythell, M.D.; Frederick Craven Moore, M.D.; Richard Walter Marsden, M.D.; Garnett Wright, M.B., F.R.C.S.Eng; George Edward Loveday, M.B.; Albert Ramsbottom, M.D.; John Wharton, M.D.; Arthur Sellars, M.D.; William Arthur Hooton.

### YEOMANRY.

*Buckinghamshire (Royal Bucks Hussars).*—The undermentioned officer, from the Buckinghamshire (Royal Bucks Hussars) Imperial Yeomanry, is appointed to the regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908: Surgeon-Captain Leonard Arthur Bidwell.

*Montgomeryshire.*—The undermentioned officer, from the Montgomeryshire Imperial Yeomanry, is appointed to the regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908: Surgeon-Captain Francis Ernest Marston.

*Queen's Own Oxfordshire Hussars.*—Surgeon-Lieutenant Archibald Henry Hogarth, from the Oxfordshire (Queen's Own Oxfordshire Hussars) Imperial Yeomanry, to be Surgeon-Lieutenant, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

### ROYAL FIELD ARTILLERY.

*2nd South Midland Brigade.*—The undermentioned officers, from the 1st Worcestershire Royal Garrison Artillery (Volunteers), are appointed to the Brigade, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Captains Arthur Charles Oldham and George Herbert Rutter, M.B.; Surgeon-Lieutenant George Mackie (to be supernumerary).

### ROYAL GARRISON ARTILLERY.

*Devonshire.*—The undermentioned officers, from the 2nd Devonshire Royal Garrison Artillery (Volunteer), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Captain James Philip Stephens Ward; Surgeon-Lieutenant George Douglas Kettlewell.

### INFANTRY.

*4th Battalion Cheshire Regiment.*—The undermentioned officers, from the 1st Volunteer Battalion, the Cheshire Regiment, are appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Captains Conrad Theodore Green, John Brown Yeoman, M.D., Andrew Robertson Wilson, M.D. (to be supernumerary).

*6th Glamorgan) Battalion Welsh Regiment.*—The undermentioned officers, from the 3rd Glamorgan Volunteer Rifle Corps, are appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Major Arthur Lloyd Jones; Surgeon-Captain George Arbour Stephens, M.D. ; Surgeon-Lieutenant Charles Leonard Isaac (to be supernumerary).

*7th Fife Battalion the Black Watch.*—The undermentioned officer, from the 6th (Fifeshire) Volunteer Battalion the Black Watch (Royal Highlanders), is appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Lieutenant David Elliot Dickson, M.B.

*5th Battalion Loyal North Lancashire Regiment.*—The undermentioned officer, from the 2nd Volunteer Battalion Loyal North Lancashire Regiment, is appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Captain James Wood.

*The Herefordshire Battalion the King's (Shropshire Light Infantry).*—The undermentioned officers, from the 1st Herefordshire Volunteer Rifle Corps, are appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Captain James Neil Macmullan; Surgeon-Lieutenant Arthur Llewellyn Baldwin Green.

*6th (Banff and Donside) Battalion Gordon Highlanders* - Surgeon-Lieutenant Ellington Reed Turner M.B., from the 4th (Donside Highland) Volunteer Battalion the Gordon Highlanders, is appointed Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*5th (Renfrewshire) Battalion Argyll and Sutherland Highlanders* —Surgeon-Captain Claude William Marshall, M.B., from the 1st (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders), to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*6th (Renfrewshire) Battalion Argyll and Sutherland Highlanders.*- Surgeon-Captain Wallace Ainsforth Pride, M.B., from the 3rd (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders), to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*7th Battalion Argyll and Sutherland Highlanders.*—Surgeon-Lieutenant Peter McFayden, M.B., from the 4th (Stirlingshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders), to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*9th (The Dumbartonshire) Battalion Argyll and Sutherland Highlanders.*—Surgeon-Captain William Buchan Armstrong, M.B., from the 1st Dumbartonshire Volunteer Rifle Corps, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

## YEOMANRY.

*Derbyshire.*—The undermentioned officer, from the Derbyshire Imperial Yeomanry, is appointed to the regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908: Surgeon-Captain William Tweed Hannah, M.D.

*Lincolnshire.*—Surgeon-Lieutenant Robert Black Purves, M.B., F.R.C.S.Edin., from the Lincolnshire Imperial Yeomanry, to be Surgeon-Lieutenant, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908.

*South Nottinghamshire Hussars.*—The undermentioned officer, from the Nottinghamshire (South Nottinghamshire Hussars) Imperial Yeomanry, is appointed to the regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908: Surgeon-Lieutenant William Trethowan Rowe, M.D.

*Pembroke (Castlemartin).*—Surgeon-Captain James Wilson, M.D., from the Pembroke Imperial Yeomanry, to be Surgeon-Captain, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Staffordshire.*—Surgeon-Lieutenant Ambrose Henry Palmer, from the Staffordshire (Queen's Own Royal Regiment) Imperial Yeomanry, to be Surgeon-Lieutenant, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

Surgeon-Lieutenant Ambrose H. Palmer to be Surgeon-Captain, dated June 24, 1908.

*The Surrey (the Princess of Wales's).*—Surgeon-Captain Reginald Courtenay Gayer, from the Surrey (the Princess of Wales's) Imperial Yeomanry, to be Surgeon-Captain, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*4th Battalion Northumberland Fusiliers.*—The undermentioned officers, from the

1st Volunteer Battalion the Northumberland Fusiliers, are appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Major (Honorary Surgeon-Lieutenant-Colonel) Duncan Stewart; Surgeon-Lieutenant James Graham Miller, M.B.

*9th Battalion the King's* (*Liverpool Regiment*).—Surgeon-Major John William Ellis, from the 6th Volunteer Battalion the King's (Liverpool Regiment), to be Surgeon-Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Major John W. Ellis to be Surgeon-Lieutenant-Colonel, dated June 15, 1908.

*4th Battalion Lincolnshire Regiment.*—The undermentioned officer, from the 1st Volunteer Battalion the Lincolnshire Regiment, is appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Major George May Lowe, M.D.

The undermentioned officer, from the 2nd Volunteer Battalion the Lincolnshire Regiment, is appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Major Harry Poole Berry, M.B.

*6th Battalion Lancashire Fusiliers.*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Charles William Thorp, F.R.C.S. I, from the 2nd Volunteer Battalion the Lancashire Fusiliers, to be Surgeon-Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

*5th* (*Flintshire*) *Battalion Royal Welsh Fusiliers.*—The undermentioned officers, from the 2nd Volunteer Battalion the Royal Welsh Fusiliers, are appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Edward Williams; Surgeon-Captain Alexander Paul Swanson.

*6th Battalion Royal Welsh Fusiliers.*—The undermentioned officers, from the 3rd Volunteer Battalion the Royal Welsh Fusiliers, are appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Major Thomas Louis Kenrick Davies, M.B.; Surgeon-Captain John Robert Williams, M.B.

*6th Battalion South Staffordshire Regiment.*—The undermentioned officer, from the 3rd Volunteer Battalion the South Staffordshire Regiment, is appointed to the battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Captain Frederick Edge, M.D.

*Dorset* (*Queen's Own*).—Surgeon-Captain George Herbert Staines Daniell, from the Dorset (Queen's Own) Imperial Yeomanry, to be Surgeon-Captain, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Gloucestershire* (*Royal Gloucestershire Hussars*).—Surgeon-Major Herbert Bramwell, M.D., from the Gloucestershire (Royal Gloucestershire Hussars) Imperial Yeomanry, to be Surgeon-Major, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*West Somerset.*—Surgeon-Captain Charles Farrant, from the West Somerset Imperial Yeomanry, to be Surgeon-Captain, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Warwickshire.*—Surgeon-Major Roger Bullock, M.D., from the Warwickshire Imperial Yeomanry, to be Surgeon-Major, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

### ROYAL GARRISON ARTILLERY.

*Cornwall.*—The undermentioned officers, from the 1st Cornwall (Duke of Cornwall's) Royal Garrison Artillery (Volunteers), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908: Surgeon-Major Robert Garven Nesbitt; Surgeon-Lieutenant Edwyn Gaved Andrew.

### ROYAL ENGINEERS.

*1st Wessex Field Company Wessex Divisional Engineers.*—Surgeon-Major Joseph Fuller, from the 1st Devonshire and Somersetshire Royal Engineers (Volunteers), to be Surgeon-Major, with precedence as in the Volunteer Force, dated April 1, 1908.

*2nd Wessex Field Company Wessex Divisional Engineers.*—Surgeon-Captain Edward Gaved Stocker, from the 1st Devonshire and Somersetshire Royal Engineers (Volunteers), to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

### INFANTRY.

*5th* (*Earl of Chester's*) *Battalion Cheshire Regiment.*—Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel Theodore Fennell, from the 3rd Volunteer Battalion the

Cheshire Regiment, to be Surgeon-Major, with the honorary rank of Surgeon-Lieutenant-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain Henry William King, M.D., from the 2nd (Earl of Chester's) Volunteer Battalion the Cheshire Regiment, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

### ROYAL ARMY MEDICAL CORPS.

*North Midland Mounted Brigade Field Ambulance.*—Robert Burnet, M.B., to be Lieutenant, dated April 1, 1908.

*1st South Midland Mounted Brigade Field Ambulance.*—William Edward Hugh Bull is appointed Transport Officer, with the honorary rank of Lieutenant, dated May 20, 1908.

*2nd South-Western Mounted Brigade Field Ambulance.*—Major Augustus William Dalby, from the Gloucester and Somerset Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

*2nd East Anglian Field Ambulance.*—John Kitton Howlett to be Lieutenant, dated September 2, 1908.

*1st Highland Field Ambulance.*—James Robertson, M.D., to be Lieutenant, dated April 14, 1908.

*2nd Highland Field Ambulance.*—James Forbes MacIntosh to be Lieutenant, dated April 14, 1908.

*3rd Highland Field Ambulance.*—John Weir Fox, M.B., to be Lieutenant, dated May 2, 1908.

Lieutenant George W. Miller to be Captain, dated June 24, 1908.

*3rd Home Counties Field Ambulance.*—Stanley Allen Coad to be Lieutenant, dated August 22, 1908.

*3rd London Field Ambulance.*—Captain Ernest Blechynden Waggett, M.B., from the London District, London Companies, Royal Army Medical Corps (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*1st Lowland Field Ambulance.*—The announcement of the transfer from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), and of his promotion to a captaincy, of Lieutenant Archibald Jubb, M.D., which appeared in the *London Gazette* of July 14, 1908, is cancelled, and the following substituted:—

Lieutenant Archibald Jubb, M.D., from the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*2nd Lowland Field Ambulance.* Alexander Macmillan Watson, M.B., to be Lieutenant, dated May 7, 1908.

*1st West Riding Field Ambulance.*—Francis Darlow, M.B., to be Lieutenant, dated July 24, 1908. Walter Lister to be Lieutenant, dated August 21, 1908.

*2nd Northern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated October 14, 1908:—

To be Lieutenant-Colonels: Thomas Churton, M.D.; Thomas Pridgin Teale, M.B., F.R.C.S.Eng., F.R.S.; Alfred George Barrs, M.D.; Harry Littlewood, F.R.C.S.Eng.

To be Majors: Thomas Wardrop Griffith, M.D.; Robert Lawford Knaggs, M.D., F.R.C.S.Eng.; Berkeley George Andrew Moynihan, M.B., F.R.C.S.Eng.; Albert Sydney Frankau Grünbaum, M.D.; Henry Secker Walker, F.R.C.S.Eng.; Walter Henry Maxwell Telling, M.D.; Walter Thompson, F.R.C.S.Eng.; George William Watson, M.D.

To be Captains: Joseph Faulkner Dobson, M.B., F.R.C.S.Eng.; James Alane Coupland, M.B., F.R.C.S.Eng.

*4th Northern General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated October 14, 1908:—

To be Lieutenant-Colonels;—Charles Brook; Charles Harrison, M.D.; George Henry Grimoldby; George Skelton Stephenson, M.D.

To be Majors: William Arthur Carline, M.D.; Edward Mansel Sympson, M.D.; James Stitt Thompson, M.D., F.R.C.S.Edin.; Thomas Walter Alfred Daman, M.B.; Algernon Westlake, M.B.; Charles Byron Turner; George William Shipman, late Surgeon-Lieutenant-Colonel, 4th Battalion Lincolnshire Regiment; William Henry Breffit Brook, M.D., F.R.C.S.Eng.

To be Captains: Devereux John Gregory Watkins, M.B.; Edward Cecil Clements; Osmund Harry Chapman, M.D.; George Alfred Cargill Shipman, M.B.; Frederick Stephenson Genney, M.B.; John Thomas Collier, M.D.; Francis Bastow Cooper, M.B.; Beattie McFarland, M.D.; Andrew Bnrgess, M.D.; Harold Charles Harrison;

Arthur Alfred Pratt, M.D.; Richard Ernest Edward South; Arthur Edward Wilson, M.B.; Percy Cranston Phillips; Alexander Miller, M.B.; Oswald Giles; John Edmund Saunders Passmore; Frederick Ernest Withers.

*2nd Scottish General Hospital.*—The undermentioned to be officers whose services will be available on mobilisation, dated July 21, 1908:—

To be Lieutenant-Colonels: George Alexander Gibson, M.D.; Joseph Montagu Cotterill, M.B., F.R.C.S.Edin.; Alexander Bruce, M.D.; Charles Walker Cathcart, M.B., F.R.C.S.Eng.

To be Majors: Robert William Philip, M.D.; Francis Mitchell Caird, M.B., F.R.C.S.Edin.; William Russell, M.D.; George Andreas Berry, M.B., F.R.C.S.Edin.; John James Graham Brown, M.D.; James William Beeman Hodsdon. M.D., F.R.C.S.Edin.; George Lovell Gulland, M.D.; David Wallace, C.M.G., M.B., F.R.C.S.Edin.

To be Captains: Francis Darby Boyd, C.M.G., M.D.; Harold Jalland Stiles, M.B., F.R.C.S.Edin.; Robert Alexander Fleming, M.D.; Henry Alexis Thomson, M.D., F.R.C.S.Edin.; Hamilton Graham Langwill, M.D.; Alexander Miles, M.D., F.R.C.S.Edin.; Harry Rainy, M.D.: Arthur Logan Turner, M.D., F.R.C.S.Edin.; Douglas Chalmers Watson, M.D.; William Guy, F.R.C.S.Edin.: William Thomas Ritchie, M.D.; John Wheeler Dowden, M.B., F.R.C.S.Edin.; Edwin Bramwell, M.B.; Archibald Adam Scot Skirving, C.M.G., M.B., F.R.C.S.Edin.; James Gibson Cattanach, M.B.; George Lyall Chiene, M.B., F.R.C.S.Edin.; Edwin Matthew, M.B.; William James Stuart, M.B., F.R.C.S.Edin.; John Eason, M.D.; Edward William Scott Carmichael, M.B., F.R.C.S.Edin.

Surgeon-Captain William Balfour Fergusson, M.D., from the 1st Gloucestershire Royal Engineers (Volunteers), to be Major, dated April 1, 1908.

John Henry Harris (late Major 1st Devonshire Royal Garrison Artillery (Volunteers), to be Major, dated April 1, 1908.

Harry Findlater Wilkin, F.R.C.S.Edin., to be Lieutenant, dated May 19, 1908.

Arthur Walker to be Lieutenant, dated August 26, 1908.

Captain Alastair Norman Fraser, M.B., R.A.M.C., to be Adjutant of a School of Instruction, *vice* Major Alexander J. MacDougall, M.B., who has vacated that appointment, dated September 1, 1908.

## VOLUNTEERS.

The King has been graciously pleased to confer the Volunteer Officers Decoration upon the undermentioned officers of the Volunteer Force, who have been duly recommended for the same under the terms of the Royal Warrant, dated July 25, 1892:—

### London District (Infantry Volunteers).

*2nd Bucks (Eton College) Volunteer Rifle Corps.*—Surgeon-Major Edward Stacy Norris, M.B.

### Scottish Command (Infantry Volunteers).

*The Queen's Rifle Volunteer Brigade, the Royal Scots (Lothian Regiment).*—Surgeon-Major John Hugh Alexander Laing, M.B.

*1st Dumbartonshire Volunteer Rifle Corps.*—Surgeon-Lieutenant-Colonel John Robert Fleming Cullen, M.D. (retired).

### Western Command (Infantry Volunteers).

*2nd Volunteer Battalion the Welsh Regiment.*—Surgeon-Lieutenant-Colonel John Arnallt Jones, M.D.

*1st Volunteer Battalion the Northumberland Fusiliers.*—Surgeon-Lieutenant Thomas Woodman, M.B., resigns his commission, dated March 31, 1908.

*4th Volunteer Battalion the Royal Fusiliers (City of London Regiment).*—Surgeon-Lieutenant Henry C. Nicholls resigns his commission, dated March 31, 1908.

*2nd (Berwickshire) Volunteer Battalion the King's Own Scottish Borderers.*—Surgeon-Lieutenant James Marr, M.B., resigns his commission, dated March 31, 1908.

*1st Volunteer Battalion the Duke of Wellington's (West Riding Regiment).*—Surgeon-Lieutenant Alfred T. Griffiths resigns his commission, dated March 31, 1908.

*3rd (The Buchan) Volunteer Battalion the Gordon Highlanders.*—Surgeon-Lieutenant-Colonel Andrew Mitchell is granted the honorary rank of Surgeon-Colonel, dated March 30, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Andrew Mitchell resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*26th Middlesex (Cyclist) Volunteer Rifle Corps.*—Surgeon-Captain Percy J. Edmunds, M.B., resigns his commission, dated March 31, 1908.

### Royal Garrison Artillery (Volunteers).

*1st Aberdeenshire.*—Surgeon-Captain William A. Macnaughton, M.D., resigns his commission, dated March 31, 1908.

*1st Banff.*—Surgeon-Lieutenant-Colonel William Ferguson, M.D., is granted the honorary rank of Surgeon-Colonel, dated March 30, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel William Fergusson, M.D., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*1st Fifeshire.*—Surgeon-Lieutenant William E. Henderson resigns his commission, dated March 31, 1908.

### Royal Garrison Artillery (Volunteers).

*The Highland.*—Surgeon-Lieutenant Edward E. Brown resigns his commission, dated March 31, 1908.

*3rd Lancashire.*—Surgeon-Lieutenant Thomas M. Scott resigns his commission, dated March 31, 1908.

*1st Orkney.*—Surgeon-Lieutenant George R. C. Russell, M.B., resigns his commission, dated March 31, 1908.

### Royal Engineers (Volunteers).

*1st Aberdeenshire.*—Surgeon-Captain Albert Henderson, M.B., resigns his commission, dated March 31, 1908.

### Rifle.

*2nd (Earl of Chester's) Volunteer Battalion the Cheshire Regiment*—Surgeon-Captain Andrew MacLennan, M.B., resigns his commission, dated March 31, 1908.

*3rd Volunteer Battalion the Cheshire Regiment.* — Surgeon-Captain Thomas A. Rothwell, M.D., resigns his commission, dated March 31, 1908.

*3rd Volunteer Battalion the Welsh Regiment.* — Surgeon-Lieutenant Irnan G. Thomas resigns his commission, dated March 31, 1908.

*1st Volunteer Battalion the Essex Regiment.*—Surgeon-Major St. Clair B. Shadwell is granted the honorary rank of Surgeon-Lieutenant-Colonel, dated March 30, 1908. Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel St. Clair B. Shadwell resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*5th Volunteer Battalion the Durham Light Infantry.*—Surgeon-Major Andrew A. Abraham is granted the honorary rank of Surgeon-Lieutenant-Colonel, dated March 30, 1908.

Surgeon-Major and Honorary Surgeon-Lieutenant-Colonel Andrew A. Abraham resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*3rd (Morayshire) Volunteer Battalion Seaforth Highlanders (Ross-shire Buffs, the (Duke of Albany's).* Surgeon-Lieutenant John Bruce, M.B., resigns his commission, dated March 31, 1908.

*4th (Donside Highland) Volunteer Battalion the Gordon Highlanders.*—The under-mentioned officers resign their commissions, dated March 31, 1908: Surgeon-Lieutenants William Henry, M.D., Phad E. Howie, M.B., and Samuel G. Davidson.

*3rd (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders).*—Surgeon-Captain Charles Whish resigns his commission, dated March 31, 1908.

*2nd Tower Hamlets Volunteer Rifle Corps.*—Surgeon-Lieutenant Hubert S. Stockton, M.B., resigns his commission, dated March 31, 1908.

*1st Volunteer Battalion the Northumberland Fusiliers.* — Surgeon-Lieutenant Robert McCoull resigns his commission, dated March 31, 1908.

*2nd Volunteer Battalion the Lancashire Fusiliers.* — Surgeon-Lieutenant John A. C. Roy resigns his commission, dated April 1, 1908.

*1st Volunteer Battalion the Royal Welsh Fusiliers.*—Surgeon-Lieutenant James L. Duncan resigns his commission, dated March 31, 1908.

*1st Volunteer Battalion the Hampshire Regiment.*—Surgeon-Captain Douglas L. Thomson resigns his commission, dated March 31, 1908.

## QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following lady has received an appointment as Staff Nurse: Miss L. E. Schneider.

*Postings and Transfers.*—Miss E. Beck, to Military Hospital, Pietermaritzburg, South Africa, from Army Headquarters, Pretoria; Miss L. M. Lyall, to Military Hospital, Bloemfontein, South Africa, from Military Hospital, Harrismith; Miss E. H. Hordley, to ss. "Plassey," for duty as Acting Matron, from Alexandra Hospital, Cosham; Miss M. M. Tunley, to ss. "Plassey," for duty, from Royal Victoria Hospital, Netley; Miss F. G. P. de Stourdza-Zrinyi, to ss. "Plassey," for duty, from Royal Infirmary, Dublin. Staff Nurses: Miss M. H. Congleton, to Military Hospital, Dover, from Alexandra Hospital, Cosham; Miss M. J. Jones, to Alexandra Hospital, Cosham, on appointment; Miss M. E. Brewer, to the Queen Alexandra Military Hospital, Millbank, London, from Cambridge Hospital, Aldershot; Miss M. E. Jacob, to Cambridge Hospital, Aldershot, from the Queen Alexandra Military Hospital, Millbank, London; Miss M. Barton, to Military Hospital, Cairo, on arrival in Egypt; Miss E. C. Ellis, to Military Hospital, Cairo, on arrival in Egypt; Miss E. B. Levay, to Military Hospital, Shorncliffe, on appointment; Miss L. A. Ephgrave, to Military Hospital, Cork, from Military Hospital, Shorncliffe; Miss L. E. Schneider, to Military Hospital, Devonport, on appointment; Miss M. D. Woodhouse, to ss. "Plassey," for duty, from Royal Herbert Hospital, Woolwich; Miss E. C. E. Lindsay, to Royal Infirmary, Dublin, on appointment; Miss M. E. Medforth, to Cambridge Hospital, Aldershot, from Royal Infirmary, Dublin.

# EXAMINATIONS.

### RESULTS OF EXAMINATIONS OF MAJORS AND LIEUTENANTS, R.A.M.C.

The following results of examinations are notified for general information:—

Passed in (*h*) i. for rank of Captain: A. D O'Carroll, M.B.; M. B. H. Ritchie, M.B.

The following extracts from the Report on the Examination held in May, 1908, are published for general information:—

### MAJORS OF THE ROYAL ARMY MEDICAL CORPS.

(Appendix XIV., King's Regulations.)

*Army Medical Organisation in Peace and War.*

*Home Stations.*—Of the five candidates examined, three were good and two indifferent.

*Stations Abroad.*—The character of the work submitted is good, and shows a thoroughly satisfactory knowledge of the subject.

*Canadian Permanent Army Medical Corps.*—Three papers submitted. Major L. Drum sent in a distinguished paper, which is considered of exceptional merit. One shows a good knowledge of the subject, the third is indifferent and is marked "failed."

*Sanitation and Epidemiology.*

*Home Stations.*—Of the six papers on Sanitation and Epidemiology, one is, in my opinion, clearly below any pass standard that could be fixed; two others are "fair," but not to be called "good," and not up to the standard now required in this examination.

In this series of papers a marked improvement is to be noticed in the answering of the *practical* (as opposed to the *text-book*) question, such as No. 4. The question of similar character, No. 3, although apparently much easier, and within the competence of any officer of the status assumed in this examination, is not nearly so well dealt with.

*Stations Abroad.*—The papers as a whole are poor; they show an inability to express opinions clearly, and to give a straight answer to a straight question. For instance, one candidate when ordered to "draw up a draft order" merely gives an index series of headings, showing his views on the subject. This point has been brought to the notice of the Director-General, Army Medical Service, not in connection with this particular candidate, or even with this particular examination, but generally.

The answers of Major C. E. Pollock are a striking exception to the general rule. His work is marked throughout by thorough knowledge, and shows evidence that he has thought about problems likely to arise in the course of his work. In addition he has the faculty, well marked, of systematic and thorough exposition of his ideas.

*Canadian Permanent Army Medical Corps.*—Two candidates do not come up to any satisfactory standard; the experience of these officers may be restricted, particularly in regard to the subjects of the 3rd and 4th questions, but the remaining questions have been answered no better than these.

One candidate answers all six questions, in defiance of the notice at the head of the question paper. This paper is, however, the best all-round paper in the series, though very untidy, and loose in expression.

### *Medical History, Foreign Army Medical Services, and Laws and Customs of War.*

*Home Stations.*—Criticism of answers shows that the candidates had no difficulty in answering the questions.

The two candidates who "failed" showed a very superficial knowledge of most of the questions, leaving out what was necessary in a satisfactory answer to each question.

The question presented no ambiguity, misprint, or undue difficulty, although the one relating to *personnel* of the Italian mountain hospital has not been correctly answered by any candidate.

*Stations Abroad.*—No remarks.

*Canadian Permanent Army Medical Corps.*—The answers of Major L. Drum were "conspicuous in merit," because he mentioned important points required in each question, although he wrote at unnecessary length.

### SUBJECTS (*h*) ii AND iii.—ROYAL ARMY MEDICAL CORPS SUBJECTS.

*Lieutenants, Home Stations.*—The character of the work in (*h*) ii. was, on the whole, very good, and in (*h*) iii. good. Three candidates failed in the former and five in the latter. One candidate, Lieutenant A. H. Heslop, M.B., R.A.M.C., passed with distinction in both (*h*) ii. and (*h*) iii.

In (*h*) ii., in addition to Lieutenant Heslop, eight officers passed with distinction. Two were very good, three good, two fair, and three papers were indifferent.

In (*h*) iii., Lieutenant Heslop passed with distinction; five officers were very good, four good, four fair, and five papers were indifferent.

In (*h*) ii. and (*h*) iii. combined, Lieutenants A. H. Heslop, M.B.; W. Mitchell, M.B.; J. A. B. Sim, M.B.; E. J. Elliot, M.B.; J. A. Bennett, M.B.; and E. C. Phelan, M.B., R.A.M.C., passed with distinction, having obtained 80 per cent. or more of the marks. Two were very good, six were good, one fair, and five papers were indifferent.

As regards Question 5 (*b*) in Subject (*h*) ii., there seems to have been some doubt in the minds of some of the candidates as to what was actually required. It was intended by the question to refer to the bedding, clothing, and personal equipment in possession of patients while in hospital; but some officers have understood the question to mean the bedding, clothing, and equipment of the whole hospital, sent weekly or oftener to be exchanged; and as there seems some reason from the question for their doing so, they have been marked accordingly. As, however, the greater includes the less, where they have not mentioned the bedding, clothing, and personal equipment of patients separately, marks have been deducted for the omission.

The writing has in every case been easily readable.

*Lieutenants, Stations Abroad.*—In Subject (*h*) ii. very good work was sent in by six officers; six officers were good, and three officers did indifferent work.

In Subject (*h*) iii. five officers were very good, five were good, four fair, and one indifferent.

Lieutenants R. W. D. Leslie, A. S. Littlejohns, and J. B. G. Mulligan, R.A.M.C., have obtained over 80 per cent. of marks in both (*h*) ii. and (*h*) iii., and one officer only failed to do so by one mark in (*h*) ii.

The writing has been easily readable, and the spelling on the whole good.

Some of the candidates have answered questions in (*h*) iii. according to the Indian Regulations, Vol. VI., and not in accordance with Regulations, Army Medical Service.

# ROYAL ARMY MEDICAL COLLEGE.

The undermentioned Captains will probably be required to attend the College course commencing about February 1, 1909: D. E. Curme, F. J. Brakenridge, W. W. Scarlett, A. O. B. Wroughton, H. Ensor, D.S.O., L. W. Harrison, E. B. Knox, C. C. Cumming, J. F. Martin, W. C. Croly, T. Biggam, F. S. Walker, D. O. Hyde, G. J. Houghton, C. H. Carr, A. C. Adderley, J. P. J. Murphy, W. M. H. Spiller, L. L. G. Thorpe, W. S. Crosthwait, W. M. Power, W. R. P. Goodwin, H. G. Pinches, H. A. Davidson, S. B. Smith, G. S. C. Hayes, H. B. Connell, E. Ryan, H. Rogers, M. F. Foulds. *Waiting Officers:* H. W. Long, A. W. Sampey, M. G. Winder, W. Davis, F. E. Rowan-Robinson, J. L. Jones, J. H. Duguid, E. S. Worthington.

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## EXAMINATION OF CAPTAINS FOR PROMOTION TO MAJOR.

The following copies of Examination Papers are published for information:—

*Hygiene.* (Written.) Monday, September 28, 1908. From 10 a.m. to 1 p.m.

[N.B.—Only four questions to be answered, of which question 5 must be one.]

(1) What are your views as to the consumption of beer or spirits by soldiers? Discuss the subject in its relation to service conditions, giving any actual facts bearing on the question with which you may be acquainted.

(2) Describe as fully as you can the parts that go to make up a disconnecting manhole (D.M.H.). State their uses, and mention the particular points in a manhole to which you would direct your attention in making a sanitary inspection of barracks.

(3) You are in medical charge of a body of troops on the march, in a country with which you are unfamiliar. In the absence of means for chemical or bacteriological examination, how would you judge of the fitness for drinking of water from (*a*) a stream, (*b*) a well, (*c*) a spring?

(4) Draw up a concise and clearly-worded memorandum of instructions for the troops in regard to *personal* measures of prevention against cholera, an outbreak of which is presumed to be threatening.

(5) Discuss the significance of *Bacillus coli* of Escherich in water. Why is this organism taken as an indicator of excretal pollution, and how would you proceed to demonstrate its presence?

*Hygiene.* (Practical.) Tuesday, September 29, 1908. From 10 a.m. to 1 p.m.

(1) Results of an analysis of a sample of water in the Royal Army Medical Corps Laboratories, Hygiene Department.—

| | |
|---|---|
| *Physical*— | |
| (*a*) Colour | Yellow. |
| (*b*) Sediment | Considerable. |
| (*c*) Smell | Earthy. |
| *Chemical*— | |
| Total solids | 36 parts per 100,000. |
| Volatile solids | 19 parts per 100,000. |
| Chlorine | 1 part per 100,000. |
| Ammonia, free | 0·005 part per 100,000. |
| Ammonia, albuminoid | ——— |
| Nitrites | *Nil.* |
| Nitrates | 0·2 part per 100,000. |
| Hardness, total | ——— |
| Hardness, removable | ——— |
| Oxygen absorbed in 15 minutes | ——— |
| Metals | None. |

*Bacteriological.*—*Bacillus coli* of Escherich found in 10 cc.

*Sediment.*—Wood fibres and vegetable *débris* found.

Complete the above chemical analysis. Give an opinion on the water sample as to its fitness for domestic purposes, with your reasons, and state what you consider the probable source of the water.

(2) Make a $\frac{N}{1}$ solution of alkali from the reagents supplied you. Estimate the acidity of the broth sample before you in terms of sulphuric acid, and say how you would bring it to a reaction of + 10.

The strengths of all standard solutions will be given on the blackboard.

*Pathology.* (Written.) Monday, September 28, 1908. From 2.30 to 5.30 p.m.

(1) Describe the pathological conditions to which the pneumococcus may give rise in man. Give the microscopic and cultural reactions of this organism, laying stress on the points by which you would differentiate it from the gonococcus and meningococcus respectively.

(2) Describe the condition of the blood in a case of spleno-medullary leukæmia.

(3) Define the following terms: Lymphocyte, opsonin, acid-fast reaction, gametocyte, amboceptor, antitoxin.

(4) Give an account of the structure and life-history of the *Bilharzia hæmatobia* and of the pathological lesions to which it gives rise in man.

*Pathology.* (Practical.) Wednesday, September 30, 1908. From 10 a.m. to 1 p.m.

(1) Examine the agar culture marked with your number, and report in your paper on the morphological characters of the germs comprising the various colonies. Leave one stained specimen from each of the different germs you may have found beside your microscope, properly labelled.

(2) Make films from the bacterial emulsion with which you are provided, and stain them so as to demonstrate the presence of spores. Label your specimen and leave it in focus under the oil-immersion lens.

(3) Stain the unfixed blood film by Romanowsky's method, and make a differential count of the leucocytes, recording in your paper the results of your count, and also your opinion as to the nature of the blood.

(4) Oral examination.

## RETIREMENT OF MR. GILLHAM.

As the subscription list for Mr. Gillham has been open for some months, and as no more officers seem to wish to subscribe, the fund is now closed, and the money will be handed to Mr. Gillham.

| | Statement of Accounts. | £ | s. | d. |
|---|---|---|---|---|
| July 1, 1908. | Brought forward .. .. .. .. | 11 | 9 | 0 |
| July 8, 1908. | Major S. W. Sweetnam .. .. .. | 1 | 1 | 0 |
| | Captain S. L. Cummins .. .. .. | 1 | 0 | 0 |
| | Captain J. S. Bostock .. . .. .. | 0 | 10 | 6 |
| | Captain J. E. Hodson .. .. .. .. | 0 | 10 | 6 |
| | Captain A. J. Williamson .. .. .. | 0 | 10 | 0 |
| | Captain D. J. F. O'Donoghue .. .. | 0 | 10 | 0 |
| | Captain L. L. Forbes Winslow .. .. | 0 | 10 | 0 |
| | Total .. | £16 | 1 | 0 |

*October* 10, 1908. C. F. Wanhill, *Major, R.A.M.C.*

## QUEENSLAND'S MILITARY FORCES.

Steps were taken, upon the separation of the Colony of Queensland from New South Wales in 1859, to provide for defence. A troop of mounted rifles was raised in March, 1860. The service was voluntary, and the force quickly increased, infantry and cavalry, subsequently supplemented by artillery, being formed of "volunteers." Grants for efficiency and a capitation allowance, with free issue of ammunition, were obtained from the Government; and orders granting fifty acres of land were available upon completion of five consecutive years of service. In 1876 the total strength was 415. The Volunteer Act of 1878 provided for the raising of a force of defence, and many citizens entered upon useful and regular training. In 1880 the total strength was 1,219 of all ranks.

But the volunteer system in Queensland, as elsewhere in Australia, was superseded. In 1883 a military committee of inquiry, appointed to consider the basis of service, reported against the system as lacking in cohesion and discipline, and in 1884 the Volunteer Act was repealed. All male inhabitants within specified ages, and with certain exceptions, were liable to serve. A small permanent corps was authorised, and the formation of partially-paid militia and volunteer corps was provided for. Under the new system the force was greatly augmented, and a higher degree of efficiency was reached. Subsequent legislation crystallised the defence system of the colony. The total strength on December 31, 1900, was 4,028, made up as shown in table hereinafter:—

Establishment and Strength of Military Forces of Queensland, December 31, 1900.

| State | Establishment. | | Strength. | |
|---|---|---|---|---|
| | Officers. | Other Ranks. | Officers. | Other Ranks. |
| Queensland .. .. | 310 | 5,035 | 291 | 3,737 |

# APPOINTMENT.

LIEUTENANT-COLONEL B. LANGLEY MILLS, R.A.M C. (R.) has obtained the D.P.H. and been appointed School Medical Officer, Sheffield.

# ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

PROCEEDINGS OF A COMMITTEE MEETING HELD AT THE WAR OFFICE ON THURSDAY, OCTOBER 15, 1908.

*Present:*

Surgeon-General Sir Charles McD. Cuffe, K.C.B., in the Chair.
Colonel J. Lane Notter.
Colonel T. Ligertwood, C.B.
Deputy-Surgeon-General C. A. Innes.
Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O.
Lieutenant-Colonel R. H. Firth.
Lieutenant-Colonel W. G. Macpherson, C.M.G.

(1) The Minutes of the last Meeting were read and confirmed.

(2) An application for a grant from Mrs. A. B. H. was considered. She has an invalid son, aged 29, and a daughter, aged 16. The application was refused, as the Committee considered she had an adequate income.

(3) A letter was read from Captain E. C. Sewell, resigning his seat on the Committee. His resignation was accepted.

(4) Colonel D. Wardrop and Major W. H. Horrocks were elected members of the Committee, *vice* Colonel A. T. Sloggett and Captain E. C. Sewell.

(5) The Secretary brought to the notice of the Committee that there is a balance of £405 11s. 1d. in the Bank.

(6) A vote of thanks to the Chairman was then passed.

F. W. H. DAVIE HARRIS, *Lieutenant-Colonel,*
*Secretary.*

# EDINBURGH UNIVERSITY GRADUATION CEREMONIAL.

A SPECIAL graduation ceremonial was held in the new Examination Room of Edinburgh University, when the following degree was conferred by the Vice-Chancellor (Sir William Turner, K.C.B.): The Degree of Doctor of Medicine—James Crawford Kennedy (Captain, R.A.M.C.), Scotland, M.B., Ch.B., 1900, "Malta Fever" (awarded gold medal for his thesis).

### THE VICE-CHANCELLOR AND DR. KENNEDY.

In presenting a Medical Faculty gold medal to Captain J. Crawford Kennedy, R.A.M.C., for his thesis on Malta Fever, the Vice-Chancellor referred to the work which Captain Kennedy had done, and for the excellence of which he was about to receive this medal. This work, he said, was of the highest importance to the welfare of the British Navy and Army. It consisted in an inquiry, as a member of the Commission of which one of the University's most distinguished graduates in medicine, Colonel Sir David Bruce, was chairman, into the whole question of Mediterranean fever, commonly called Malta fever, and the mode of preventing this fever. It was a source of great gratification to the members of the University that the chairman of this Commission and Dr. Kennedy were trained in the Medical School of the University of Edinburgh, and were graduates of the University. The inquiry which these gentlemen had carried out with so much success had practically added the services of a whole regiment to the strength of the British Army in the garrison station of Malta, so that in this respect Dr. Kennedy, and those associated with him, had discharged a most important public service. It was with great pleasure that the Faculty of Medicine had decided to award this medal in recognition of the distinguished merit exhibited in the thesis submitted for the degree of doctor of medicine.

# STAFF OFFICERS OF DIVISIONS OF THE TERRITORIAL FORCE.

THERE are eight vacant appointments, open to retired officers, as Staff Officers to Administrative Medical Officers of Divisions of the Territorial Force. The salary of these posts will be at the rate of £150 a year. Applications for them should be addressed to the Director-General.

# ROYAL ARMY MEDICAL CORPS FUND.

PROCEEDINGS OF A COMMITTEE MEETING, HELD AT THE WAR OFFICE AT 3 P.M. ON THURSDAY, OCTOBER 15, 1908.

*Present:*

Surgeon-General W. L. Gubbins, C.B., M.V.O., Vice-Chairman, in the Chair.
Surgeon-General Sir Charles McD. Cuffe, K.C.B.
Colonel D. Wardrop.
Colonel Sir James Clark, Bart., C.B.
Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O.
Major C. G. Spencer.
Captain A. Bruce.

(1) The Minutes of the last Meeting were read and confirmed.

(2) It was voted that the following sums were received from Companies for the General Relief Fund, for the quarter ending, September 30, 1908:—

| | | | | £ | s. | d. |
|---|---|---|---|---|---|---|
| No. | 11 | Company, | Dover | 3 | 0 | 0 |
| ,, | 12 | ,, | Woolwich | 2 | 10 | 9 |
| ,, | 15 | ,, | Belfast | 5 | 13 | 0 |
| ,, | 17 | ,, | Curragh | 2 | 0 | 0 |
| ,, | 20 | ,, | Bulford | 1 | 0 | 0 |
| ,, | 22 | ,, | Cape Town | 5 | 0 | 0 |
| ,, | 27 | ,, | Hong Kong | 3 | 15 | 11 |
| ,, | 28 | ,, | Gibraltar | 5 | 0 | 0 |
| ,, | 30 | ,, | Malta | 5 | 0 | 0 |
| ,, | 33 | ,, | Egypt | 6 | 0 | 0 |

(3) The grants made from the General Relief Fund, for the quarter ending September 30, were confirmed. A list of recipients is attached to these proceedings.

(4) The Aldershot Band Accounts were considered and passed, and are attached to these Minutes.

(5) Captain H. R. Bateman having resigned his seat on the Committee, the Principal Medical Officer, Aldershot, nominated Captain G. G. Delap, D.S.O., as his successor, and he was duly elected a member of the Committee.

(6) Lieutenant-Colonel E. O. Wight and Lieutenant-Colonel H. Charlesworth, C.M.G., were elected to represent retired officers on the Committee, *vice* Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O., and Lieutenant-Colonel A. B. Cottell, who retired, having been for four years in office.

(7) It was noted that a Grant of £50 has been made to the Royal Army Medical College in accordance with a resolution passed at the last Annual General Meeting.

(8) Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O., and Lieutenant-Colonel A. A. Sutton, D.S.O., were elected auditors, *vice* Surgeon-General A. T. Sloggett, C.M.G., and Colonel D. Wardrop.

(9) It was noted that girl Emily Grace Gardiner has been admitted to the Royal Soldiers' Daughters' Home on payment of £19 per annum.

(10) The Solicitor's bill for drawing up the Trust Deed for the General Relief Fund was then considered, and it was resolved to pay the account of £13 4s. from the General Relief Fund.

## ROYAL ARMY MEDICAL CORPS FUND.

### Recipients from the General Relief Fund for the Quarter ending September 30, 1908.

| Name | Age | District | Grant | Total grant | Particulars |
|---|---|---|---|---|---|
| Mrs. N. S. .. | 65 | London .. | £2 | £40 | Poverty and old age, gets 3s. per week parish relief. |
| Mrs. M. A. W... | 34 | ,, .. | £2 | £8 | A deserving case; four young children to support; recently confined. |
| Mrs. E. P. .. | 42 | ,, .. | £2 | £6 | Keeps a small shop; has been ill of late, three children. |
| Mrs. A. D. G. .. | 41 | ,, .. | £2 | £46 | Earns 12s. per week; three children to support. |
| Mr. H. N. .. | 44 | ,, . | £2 | £54 | Almost blind, unable to work. |
| Mrs. M. I. .. | 64 | Dublin .. | £2 | £78 | Decrepit; suffers from rheumatism; unable to work. |
| Mrs. A. B. .. | 48 | ,, .. | £1 | £16 | Has two children dependent on her; earns 1s. 3d. per week. |
| Mrs. M. S. .. | 70 | ,, .. | £2 | £90 | Decrepit and blind. |
| Mrs. J. H. .. | 28 | ,, .. | £2 | £4 | Suffers from bilharzia hæmatobia; recommended by Chelsea Commissioners. |
| Mr. J. B. .. | 78 | Devonport | £2 | £4 | Old, feeble, confined to bed; unable to work. |
| Mr. G. J. A. .. | | | £1 | £1 | Destitute. |
| Mr. J. S. .. | 27 | Dublin .. | £2 | £2 | Cannot get work. |
| Mr. F. W. .. | 59 | Netley .. | £4 | £8 | Suffers from paralysis; unable to work. |
| Mr. W. J. C. .. | 29 | London .. | £1 | £1 | Out of work and destitute. |
| Mr. T. S. .. | 38 | Portsmouth | £4 | £8 | Suffers from paralysis; quite unable to work. |
| Mrs. M. S. .. | 38 | Aldershot.. | £3 | £3 | A deserving case; five young children dependent on her. |
| Mr. R. B. .. | 24 | Nottingham | £1 | £1 | Destitute and out of work. |
| Mr. J. La P. .. | 34 | Guernsey.. | £4 | £8 | Suffers from tuberculosis; quite unfit to work. |
| Mrs. E. J. W. .. | 30 | Alverstoke | £2 | £2 | Help required until permanent work is obtained. |
| Mrs. T. .. .. | 38 | Leeds .. | £2 | £4 | Several children to support. |
| Mr. W. L. .. | 64 | Belfast .. | £2 | £4 | Suffers from chronic Bright's disease; unable to work. |
| Mrs. M. G. .. | 65 | Portsea .. | £2 | £4 | Poverty; applicant too feeble to earn her livelihood. |

Total grants, £47.

## BIRTHS.

CONNOR.—On October 8, at "Wen Voe," Newport, Isle of Wight, the wife of Major J. C. Connor, R.A.M.C., of a son.

HATHAWAY.—On October 2, 1908, at Red Lodge, Craneswater Park, Southsea, the wife of Colonel H. Hathaway, of a daughter.

## MARRIAGE.

BARBOUR—MORRISON.—On September 30, at St. Paul's Church, Garvagh, Co. Londonderry, Captain John Humphrey Barbour, R.A.M.C., son of Humphrey Barbour, Bangor, Co. Down, to Eileen Margaret, daughter of the Rev. W. Morrison, LL.D., T.C.D., the Rectory, Garvagh, Co. Londonderry.

# ROYAL ARMY MEDICAL CORPS BAND FUND.

## BALANCE SHEET FOR QUARTER ENDING SEPTEMBER 30, 1908.

### RECEIPTS.

| Date. 1908. | | £ | s. | d. |
|---|---|---|---|---|
| July 1. | Balance credit | 18 | 0 | 2 |
| ,, ,, | Expenses for playing at R.A.M. College | 10 | 4 | 10 |
| ,, 14. | Musical engagement at Wimbledon | 12 | 12 | 0 |
| ,, 17. | Officers' Subscription, Aldershot (June) | 4 | 17 | 6 |
| ,, 20. | Quarterly grant from Corps Fund | 170 | 0 | 0 |
| Aug. 13. | Officers' Subscription, Aldershot (July) | 5 | 10 | 0 |
| ,, 14. | Officers' Subscription | 0 | 5 | 0 |
| ,, 19. | Musical Engagement at Guildford | 14 | 3 | 6 |
| ,, ,, | ,, ,, at Aldershot | 7 | 10 | 0 |
| Sept. 14. | ,, ,, at Virginia Water | 9 | 12 | 11 |
| ,, 21. | Officers' Aldershot Subscriptions (August) | 5 | 7 | 6 |
| | Balance Dr. | 7 | 15 | 9½ |
| | | £265 | 19 | 2½ |

### EXPENDITURE.

| Date. 1908. | | £ | s. | d. |
|---|---|---|---|---|
| July 18. | To Band for Musical Engagement at Wimbledon | 11 | 6 | 10 |
| ,, 20. | ,, H. Watford, repairing Band Boxes | 0 | 15 | 0 |
| ,, 29. | ,, Bandmaster's Salary | 10 | 0 | 0 |
| ,, ,, | ,, Band Pay | 12 | 8 | 0 |
| ,, ,, | ,, Band for Musical Engagement at Aldershot | 6 | 15 | 0 |
| Aug. 6. | ,, Messrs. Humphries & Co. for Bandmaster's Hut | 99 | 0 | 0 |
| Sept. 1. | ,, Bandmaster's Salary | 10 | 0 | 0 |
| ,, ,, | ,, Band Pay | 12 | 8 | 0 |
| ,, ,, | ,, Band for Musical Engagement at Guildford | 12 | 15 | 2 |
| ,, ,, | ,, Hire of Cart, July 22 | 0 | 4 | 0 |
| ,, ,, | ,, Band for Musical Engagement at Virginia Water | 8 | 13 | 8 |
| ,, 22. | ,, Bandmaster's Salary | 10 | 0 | 0 |
| ,, ,, | ,, Band Pay | 12 | 6 | 10 |
| ,, ,, | ,, Postage | 0 | 5 | 4 |
| ,, ,, | ,, Small Repairs | 0 | 2 | 0 |
| ,, ,, | ,, Office Stationery, &c. | 0 | 7 | 9½ |
| ,, ,, | ,, Messrs. Gale and Polden | 1 | 5 | 0 |
| ,, ,, | ,, Hawkes & Son | 10 | 4 | 2 |
| ,, ,, | ,, Boosey and Co. | 10 | 17 | 8 |
| ,, ,, | ,, Master Tailor altering a Tunic | 0 | 12 | 5 |
| ,, ,, | ,, Advanced Band for Expenses and Fees, playing at R.A.M. College, September 8 and 22, 1908 | 10 | 4 | 10 |
| ,, ,, | ,, Mr. James Cockerell, foundations Band Practice Hut | 25 | 7 | 6 |
| | | £265 | 19 | 2½ |

*Aldershot, October* 1, 1908.

# EXCHANGES, &c.

*The charge for inserting Notices respecting Exchanges in the Royal Army Medical Corps is 5/- for not more than five lines, which should be forwarded by Cheque or P.O.O., with the notice, to Messrs. G. STREET and CO., Ltd., 8, Serle Street, London, W.C., not later than the 22nd of the month.*

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| | 8 | 0 4 6 | 0 2 0 | | | | |
| | 16 | 0 7 6 | 0 3 6 | | | | |
| 25 | 4 | 0 3 0 | 0 1 3 | 4 0 | 1 3 | 3 6 | 0 9 |
| | 8 | 0 5 6 | 0 2 6 | | | | |
| | 16 | 0 9 6 | 0 4 6 | | | | |
| 50 | 4 | 0 4 0 | 0 1 8 | 5 0 | 1 9 | 4 0 | 1 0 |
| | 8 | 0 6 9 | 0 3 2 | | | | |
| | 16 | 0 12 0 | 0 5 3 | | | | |
| 100 | 4 | 0 5 6 | 0 2 9 | 6 6 | 3 3 | 5 6 | 2 0 |
| | 8 | 0 9 0 | 0 4 4 | | | | |
| | 16 | 0 16 9 | 0 6 9 | | | | |
| 200 | 4 | 0 8 6 | 0 4 0 | 9 0 | 6 3 | 7 6 | 4 0 |
| | 8 | 0 13 6 | 0 6 0 | | | | |
| | 16 | 1 3 6 | 0 8 9 | | | | |

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# Notices.

## EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W.

Communications have been received from Dr. F. E. Freemantle, Colonels Forman and Harwood, Major F. Smith, D.S.O., Major P. H. Whiston, Major H. C. French, Colonel H. Hathaway, Captain H. J. McGrigor, Lieutenant-Colonel Firth, Lieutenant-Colonel W. G. Macpherson, C.M.G., Captain Churton, Captain E. Bourke, Lieutenant-Colonel R. E. R. Morse, Major W. Mould, Lieutenant-Colonel C. Birt, Lieutenant-Colonel R. J. Simpson, Major F. J. Morgan, and Lieutenant-Colonel R. Porter.

The following periodicals have been received:—

*British: The British Journal of Tuberculosis, Transvaal Medical Journal, Australian Medical Gazette; Annual Report Government Laboratories, Transvaal; Indian Public Health, Medical Press and Circular, The Royal Engineers' Journal, The Medical Review, The Hospital, Red Cross News, On the March, Journal of the Royal Sanitary Institute, St. Bartholomew's Hospital Report, The Natal Agricultural Journal, Public Health, Army and Navy Gazette, The Quarterly Journal of Medicine, Journal of the Royal Institute of Public Health, The Queen's Own Gazette, The Medical Press and Circular, The Journal of Tropical Medicine and Hygiene, The British Medical Journal, The Lancet, Cavalry Journal, Guy's Hospital Gazette, The All-India Hospital Assistants' Journal, The Middlesex Hospital Journal.*

*Foreign: Le Caducée, Giornale di Medicina militare, Revista de Sanidad militar y la Medicina militar Española, Bulletin de l'Institut Pasteur, Boletin de Sanidad Militar, Deutsche Militärärztliche Zeitschrift, Archiv für Schiffs- und Tropen-Hygiene, Annual Report of the Henry Phipps Institute for the Study of Tuberculosis, Archives de Médecine et de Pharmacie militaires, American Medicine, Bulletin of Johns Hopkins Hospital, Archives de Médecine Navale, Annali di Medicina Navale e Coloniale, Japanese Medical Journal, Der Militärarzt, Military Surgeon, Annales d'Hygiene et de Médecine Coloniales, Russian Medical Journal, Le Journal Médical Français, Reports from Treasury Department Public Health and Marine Hospital Service of the United States.*

# MANAGER'S NOTICES.

The JOURNAL OF THE ROYAL ARMY MEDICAL CORPS is published monthly, six months constituting one volume, a volume commencing on 1st July and 1st January of each year.

The Annual Subscription is £1 (which includes postage), and should commence either on 1st July or 1st January; but if a subscriber wishes to commence at any other month he may do so by paying for the odd months between 1st July and 1st January at the rate of 1s. 8d. (one shilling and eightpence) per copy. (All subscriptions are payable in advance.)

Single copies can be obtained at the rate of 2s. per copy.

The Corps News is also issued separately from the Journal, and can be subscribed for at the rate of 2s. (two shillings) per annum, including postage. Subscriptions should commence from 1st July each year; but if intending subscribers wish to commence from any other month, they may do so by paying for the odd months at the rate of 2d. per copy. (All subscriptions are payable in advance.)

**Officers of the Royal Army Medical Corps possessing Diplomas in Public Health, &c., are kindly requested to register their special qualifications at Headquarters. Letters of complaint are frequently received from officers stating that their special qualifications have not been shown in the Distribution List which is published as a supplement to the Journal in January and July of each year. As, however, the particulars of this list are supplied from official sources, officers are reminded that unless the possession of Diplomas, &c., has been registered at Headquarters, no entry of such qualifications can be recorded in the Distribution List.**

**Letters regarding non-delivery of the Journal, or change of address, should be sent to the Hon. Manager, "Journal of the Royal Army Medical Corps," War Office, Whitehall, London, S.W., and reach there not later than the 25th of each month.**

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WAR OFFICE, WHITEHALL, S.W.

# JOURNAL

OF THE

# ROYAL ARMY MEDICAL CORPS.

## Corps News.

### December, 1908.

### ARMY MEDICAL SERVICE.—GAZETTE NOTIFICATIONS.

Lieutenant-Colonel Charles G. D. Mosse retires on retired pay, dated October 17, 1908. He entered the Service February 5, 1881; was promoted Surgeon-Major, Army Medical Staff, February 5, 1893; Lieutenant-Colonel, Royal Army Medical Corps, February 5, 1901; Lieutenant-Colonel, with increased pay under Art. 365, Pay Warrant, June 11, 1904. His war services are as follows: Expedition to Sherbro, West Coast of Africa, 1883. Mentioned in Despatches. South African War, 1899-1902; served as Senior Medical Officer in St. Helena. Queen's medal.

Lieutenant-Colonel Walter G. A. Bedford, C.M.G., M.B., from the Royal Army Medical Corps, to be Colonel, dated September 19, 1908.

### ROYAL ARMY MEDICAL CORPS.

Major Harold S. Peeke is placed on temporary half-pay on account of ill-health, dated October 18, 1908.

Major Harold S. Peeke, half-pay, retires on retired pay, dated October 24, 1908. He entered the Service July 27, 1887; was promoted Major, Royal Army Medical Corps, July 27, 1899; placed on temporary half-pay on account of ill-health, October 18, 1908. His war services are as follows: Nile Expedition, 1898. Egyptian Medal; Medal.

The undermentioned Captains to be Majors, dated October 28, 1908: Leonard Addams-Williams, and Malcolm MacG. Rattray, M.B.

Captain Dudley S. Skelton is seconded for Service under the Colonial Office, dated October 14, 1908.

Captain John F. C. Mackenzie, M.B., resigns his commission, dated October 28, 1908. He entered the Service July 30, 1904; was promoted Captain, Royal Army Medical Corps, January 30, 1908. War service, *nil.*

Lieutenant-Colonel Edward L. Maunsell is placed on retired pay, dated November 3, 1908. He entered the Service July 31, 1880; was promoted Surgeon-Major, Army Medical Staff, July 31, 1892; Lieutenant-Colonel, Royal Army Medical Corps, July 31, 1900; Lieutenant-Colonel, Royal Army Medical Corps, under Art. 365, Pay Warrant, November 11, 1903.

Lieutenant-Colonel William Rowney, M.D., retires on retired pay, dated November 4, 1908. He entered the Service February 5, 1881; was promoted Surgeon-Major, Army Medical Staff, February 5, 1893; Lieutenant-Colonel, Royal Army Medical Corps, February 5, 1901; Lieutenant-Colonel, with increased pay, under Art. 365, Pay Warrant, October 4, 1905. His war services are as follows: Egyptian Expedition, 1882. Medal; Bronze star. Soudan Expedition, 1885. Suakim. Clasp. Soudan, 1885-86, Frontier Field Force. Soudan, 1888-89, Action at Gemaizah. Clasp.

Quartermaster and Honorary Captain Edward Lines, Royal Army Medical Corps, is granted the honorary rank of Major, dated October 4, 1908.

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Lieutenant-Colonel H. J. Barnes (retired) is in possession of 4 clasps for the South African Campaign, and not 3 as stated in the September Journal.

Captain C. A. J. A. Balck, Royal Army Medical Corps, has been appointed Honorary Surgeon to the Viceroy of India, in recognition of his services in the Mohmand Expedition.

**ARRIVALS HOME.**—(*Tour Expired*). From India: Lieutenant-Colonels J. Fallon, J. J. Russell, T. P. Woodhouse and F. R. Newland, Majors E. H. Condon and W. Tibbits; Captains D. O. Hyde, J. H. Conway, R. Storrs, F. S. Walker, R. J. Franklin and F. A. H. Clarke. From Malta: Lieutenant-Colonel R. Jennings. From Gibraltar: Major B. W. Longhurst. From West Coast of Africa: Captains H. D. Packer, C. J. O'Gorman and N. C. J. Rutherford (by exchange with Captain F. W. Cotton).

**TRANSFERS TO HOME ESTABLISHMENTS.**—From Malta: Major C. B. Lawson. From India: Major A. P. Blenkinsop; Captains H. G. Pinches and H. V. Bagshawe.

**POSTINGS.**—Lieutenant-Colonels R. Jennings and T. P. Woodhouse, Major C. B. Lawson, Captains H. G. Pinches and R. Storrs to Southern Command; Lieutenant-Colonel F. H. M. Burton, Majors B. W. Longhurst and W. Tibbitts, and Captain N. J. C. Rutherford to Eastern Command; Lieutenant-Colonel J. J. Russell, Captains D. O. Hyde and F. S. Walker to Irish Command; Lieutenant-Colonel J. Fallon and Major E. H. Condon to Western Command; Lieutenant-Colonel F. R. Newland and Captains J. M. H. Conway and F. A. H. Clarke to Northern Command; Captain R. J. Franklin to Scottish Command; Major L. A. Mitchell to Aldershot Command; Major A. P. Blenkinsop to London District.

**APPOINTMENTS.**—Lieutenant-Colonel S. G. Allen, Recruiting Medical Officer, London District; Lieutenant-Colonel T. P. Woodhouse, charge of Royal Victoria Hospital, Netley; Lieutenant-Colonel F. R. Newland as Staff Officer to Principal Medical Officer, Northern Command; Captain L. Wood, as Adjutant, Royal Army Medical Corps School of Instruction, East Lancashire Division, Territorial Force; Captain H. P. W. Barrow, Adjutant, Royal Army Medical Corps School of Instruction, West Lancashire Division, Territorial Force; Captain W. L. Baker, Specialist in Ophthalmology, Dublin.

**EXCHANGES.**—Captain H.G. S. Webb, R.A.M.C., and Captain P. G. Easton, I.M.S.

**TRANSFERS.**—Major H. A. Bray, London District to Eastern Command; Captains E. S. Worthington and A. D. Waring, Irish Command to Eastern Command; Captain W. M. B. Sparks, Aldershot to London District; Captain W. L. Baker, Aldershot to Irish Command; Lieutenant J. C. L. Hingston, Aldershot to Scottish Command; Lieutenant F. H. Bradley, Western to Scottish Command; Lieutenant J. H. Graham, Egypt to Gibraltar.

**INCREASED PAY.**—The undermentioned officers have been selected for increased pay of that rank: Lieutenant Colonels C. R. Tyrell, W. B. Thomson, R. J. S. Simpson, C.M.G., and T. W. O. H. Hamilton, C.M.G.

**ARRIVALS HOME ON LEAVE.**—From India: Lieutenant-Colonel T. J. O'Donnell; Major A. H. Waring; Captains H. Harding and H. V. Bagshawe. From Malta: Major C. M. Fleury.

**EMBARKATIONS.**—Transport "Rewa," October 16, 1908, for India: Majors J. C. Weir and J. W. Bullen; Captains H. K. Palmer, J. H. Barbour and W. P. Gwynn. Transport "Rohilla," November 4, 1908, for India: Majors R. J. Blackham, D. D. Shanahan and M. Swabey; Captains B. F. Wingate and G. M. Goldsmith. Lieutenants J. L. Wood and H. G. Gibson (for Malta). For Mauritius, October 31, 1908: Captain P. MacKessack and Lieutenant G. B. Edwards. For Jamaica, November 11, 1908: Lieutenant-Colonel H. O. Trevor, Major R. J. D. Hall, Captains F. G. Richards and H. C. Sidgwick. For Bermuda, November 14, 1908: Major H. C. Thurston, C.M.G.; Captain P. H. Falkner and Lieutenant J. A. B. Sim.

**LIST OF CASUALTIES.**

*Discharges.*—7059 Quartermaster-Serjeant J. R. Shaw, October 13, 1908, after three months notice; 8166 Quartermaster-Serjeant W. E. Barber, October 26, 1908, with less than twenty-one years service; 3956 Staff-Serjeant J. J. Jackson, October 19, 1908, after three months notice; 4584 Staff-Serjeant T. J. Spary, October 28, 1908, having reached the age; 8603 Serjeant J. Jenkins, October 31, 1908, medically unfit; 10904 Private A. Mills, October 21, 1908, termination first period; 1508 Private H. S. Edwards, October 26, 1908, medically unfit; 11333 Private G. C. Fowles, October 21, 1908, termination first period; 17313 Private J. Smith, October 31, 1908, medically unfit; 17995 Private E. C. Le Breton, November 2, 1908, to pension; 11346 Private F. W. Helyer, November 3, 1908, termination second period; 1873 Private W. Tait, November 3, 1908, on payment of £10.

*Transferred to the Army Reserve.*—19754 Private P. Dove, October 10, 1908; 19920 Private D. T. Morris, October 12, 1908; 14628 Private J. E. Honey, October 14, 1908; 19928 Private H. G. Hill, October 16, 1908; 1323 Private W. Jordon, October 16, 1908; 1315 Private H. Ord, October 14, 1908; 19923 Private F. J. Evans, October 14, 1908; 19925 Private C. O'Neill, October 15, 1908; 1316 Private E. Evans, October 13, 1908; 1312 Private W. Johnson, October 13, 1908; 1320 Private W. Johnstone, October 11, 1908; 1314 Private A. Milner, October 14, 1908; 1318 Private T. Payton, October 14, 1908; 1324 Private H. Mechan, October 15, 1908; 1322 Private G. Harrison, October 16, 1908; 1321 Private H. Rumble, October 15, 1908; 14642 Private H. F. Atkinson, October 15, 1908; 1311 Private H. C. Savage, October 13, 1908; 14621 Corporal R. Smith, October 14, 1908; 19931 Private F. Cousens, October 17, 1908; 19934 Private S. Clapham, October 19, 1908; 256 Private J. W. Rains, October 18, 1908; 1317 Private J. Bilbe, October 14, 1908; 1319 Private W. Bangs, October 15, 1908; 1325 Private C. W. Westlake, October 17, 1908; 1337 Private A. Dunkley, October 22, 1908; 1339 Private F. W. Archer, October 23, 1908; 19943 Private E. Eddington, October 23, 1908; 1330 Private T. Fisher, October 22, 1908; 1331 Private A. J. Webb, October 22, 1908; 1343 Private H. E. Mauley, October 23, 1908; 1329 Private A. Skinner, October 22, 1908; 1334 Private J. Austin, October 23, 1908; 1333 Private W. A. Thomas, October 22, 1908; 1332 Private D. Smith, October 22, 1908; 14644 Private G. E. Sutton, October 24, 1908; 1340 Private G. H. Allen, October 23, 1908; 14653 Private W. Pollard, October 22, 1908; 1327 Private H. Farrow, October 18, 1908; 1338 Private R. A. Nunney, October 22, 1908; 19948 Private L. V. Law, October 25, 1908; 19949 Private R. J. Fauvel, October 25, 1908; 1345 Private A. Crooks, October 27, 1908; 19952 Private J. Connolly, October 24, 1908; 1341 Private J. Endeacott, October 25, 1908; 19953 Private F. Tilly, October 26, 1908; 1349 Private P. Ord, October 27, 1908; 1347 Private M. White, October 30, 1908; 19956 Private W. Kent, October 29, 1908; 851 Private J. E. Lewis, October 29, 1908; 1346 Private H. J. Matthews, October 28, 1908; 1351 Private E. Rannow, October 28, 1908; 1352 Private T. Blackman, October 29, 1908; 19957 Private F. W. Gale, October 31, 1908; 19967 Private W. H. Oldfield, November 5, 1908; 14684 Private W. Porter, November 7, 1908; 19970 Private C. E. Browne, November 5, 1908; 1361 W. Campbell, November 6, 1908; 19974 Private J. Wainwright, November 9, 1908.

*Transferred from other Corps.*—2113 Private H. Bickers, September 15, 1908, from K.R.R. Corps; 2114 Private H. S. Stokes, September 18, 1908, from Worcester Regiment; 2115 Private A. C. Taylor, September 22, 1908, from Worcester Regiment; 6278 Staff-Serjeant T. Johnstone, October 31, 1908, from R.A.M.C.(M.), Cork.; 5671 Serjeant W. H. Servey, October 31, 1908, from R.A.M.C.(M.), Cork; 10831 Serjeant H. W. G. Gregory, November 12, 1908, R.A.M.C.(M.), Aldershot.

*Transferred to other Corps.*—8879 Staff-Serjeant W. J. Wells, October 9, 1908, Welsh Division Training School, Cardiff; 8288 Staff-Serjeant M. Andrews, October 26, 1908, Edinburgh University Officers' Training Corps; 9703 Serjeant W. B. Heponstall, October 30, 1908, Notts and Derby Mounted Brigade Field Ambulance; 10710 Serjeant J. Moore, November 6, 1908, Colonial Government (N. Nigeria); 19507 Private A. J. Barrett, October 10, 1908, Royal Marine Light Infantry; 1063 Private J. W. Payne, October 22, 1908, Royal Garrison Artillery; 1812 Private E. Taylor, November 7, 1908, 2nd Dragoons.

*Appointments.*—19322 Private H. Elliott, November 5, 1908, 19396 Private H. Baker, November 5, 1908, 586 Private W. A. Gordon, November 5, 1908, 751 Private A. J. Milne, November 5, 1908, to be Lance-Corporal, Special, in accordance with para. 281 S.O.

### THE FOLLOWING N.C.O.'S AND MEN HAVE QUALIFIED FOR PROMOTION IN THE VARIOUS CORPS EXAMINATIONS.

*For Staff-Serjeant.*—8187 Staff-Serjeant A. P. Paddick.

*For Serjeant.*—11465 Lance-Serjeant H. G. Lenton.

*For Corporal.*—12344 Private F. H. Lucas, 14090 Private F. W. Wells, 11822 Private G. E. Johnson, 18759 Private T. J. Bogosoff.

*Deaths.*—17537 Lance-Corporal T. Macrory, August 29, 1908, at Cosham; 11147 Serjeant C. E. Maxwell, September 9, 1908, at Dublin; 19610 Private C. E. McEnery, September 13, 1908, at Woolwich.

**Promotions.**—The following promotions will take effect from the dates specified, to complete the Establishment authorised for 1908-09:—

*To be Serjeant-Major.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 8395 | Qmr.-Serjt. R. Stanley.. | 16.8.08 | .. | On re-posting from Colonial Government, *vice* T. H. Williams, to pension. |

*To be Quartermaster-Serjeants.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 9737 | Staff-Serjt. E. Bennett.. | 2.7.08 | .. | *Vice* W. Ward, to Territorial Forces. |
| 10009 | ,, J. D. Genese | 19.7.08 | .. | ,, J. Wilton, to pension. |
| 10369 | ,, G. A. Collier | 30.7.08 | .. | ,, F. S. Marsland, to pension. |
| 8268 | ,, G. B. Walker | 1.9.08 | .. | ,, W. Woolley, to pension. |

*To be Staff-Serjeants.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 11051 | Serjt. H. Williams .. | 2.7.08 | .. | *Vice* C. M. Blanchette, to pension. |
| 9875 | ,, A. E. Shaw .. | 2.7.08 | .. | ,, E. Bennett, promoted. |
| 12960 | ,, J. W. Willsher .. | 6.7.08 | .. | ,, W. H. Butler, to Territorial Forces. |
| 9910 | ,, E. H. Beeton .. | 6.7.08 | .. | ,, J. W. Willsher, supernumerary at War Office. |
| 12668 | ,, G. Sellex .. .. | 6.7.08 | .. | ,, E. H. Beeton, to Territorial Forces. |
| 10895 | ,, W. E. Perritt .. | 9.7.08 | .. | ,, C. Warner, to Territorial Forces. |
| 9436 | ,, L. E. W. Tempest | 19.7.08 | .. | ,, J. D. Genese, promoted. |
| 11059 | ,, J. Dunn .. .. | 20.7.08 | .. | ,, C. J. Tunn, to Territorial Forces. |
| 9144 | ,, J. F. Meredith .. | 30.7.08 | .. | ,, G. A. Collier, promoted. |
| 10011 | ,, J. H. Taylor .. | 1.9.08 | .. | ,, G. B. Walker, promoted. |
| 10304 | ,, A. Dearsley .. | 1.9.08 | .. | ,, J. H. Taylor, to Territorial Forces. |
| 10699 | ,, B. D. Conolly .. | 8.9.08 | .. | ,, F. G. Payne, to Territorial Forces. |
| 12386 | ,, E. Purchase .. | 12.9.08 | .. | ,, G. Fells, to pension |

*To be Serjeants.*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 15983 | Lce.-Serjt. C. E. Lister.. | 2.7.08 | Nursing .. | *Vice* H. Williams, promoted. |
| 11867 | ,, W. Wright.. | 2.7.08 | ,, .. | ,, A. E. Shaw, promoted. |
| 16048 | ,, W. J. Taylor | 6.7.08 | ,, .. | ,, G. Sellex, promoted. |
| 10400 | ,, T. F. Catley | 9.7.08 | ,, .. | ,, W. E. Perritt, promoted. |
| 17973 | ,, F. Knott .. | 19.7.08 | Clerical .. | ,, L. E. W. Tempest, promoted. |
| 19046 | ,, S. J. Phillips | 20.7.08 | Nursing .. | ,, J. Dunn, promoted. |
| 12537 | ,, F. Molloy .. | 30.7.08 | General Duty | ,, J. F. Meredith, promoted. |
| 18718 | ,, W. H. Parr.. | 1.9.08 | Q.A.I.M.N.S. | ,, A. Dearsley, promoted. |
| 9351 | ,, G. Howard.. | 8.9.08 | Cooking .. | ,, B. D. Conolly, promoted. |
| 16097 | ,, E. Bowen .. | 10.9.08 | Clerical .. | ,, N. B. Neilan, to pension. |
| 14359 | ,, J. G. Thomas | 12.9.08 | General Duty | ,, E. Purchase, promoted. |

*To be Corporals.*

| | | | | |
|---|---|---|---|---|
| 11809 | Lce.-Cpl. A. Howman .. | 1.10.08 | General Duty | To complete Establishment, 1908-09. |
| 14334 | ,, S. Rose .. | | Cooking .. | |
| 18957 | ,, A. C. Smith .. | | Nursing .. | |
| 14569 | ,, F. Littleworth | | ,, .. | |
| 14623 | ,, S. F. D. Davidson | | General Duty | |
| 14686 | ,, W. A. Wilson.. | | ,, ,, | |
| 14761 | ,, W. Robertson | | Cooking .. | |
| 14797 | ,, J. E. Cooke .. | | Nursing .. | |
| 11236 | ,, B. A. Embelin | | Q.A.I.M.N.S. | |
| 11763 | ,, J. T. G. W. Green | | General Duty | |
| 14580 | ,, S. R. Gurnsey | | Cooking .. | |
| 14924 | ,, J. G. A. Forbes | | Nursing .. | |
| 14955 | ,, A. Ford .. | | ,, .. | |
| 64 | ,, W. Jenkins .. | | Clerical .. | |
| 15183 | ,, C. Dewhurst .. | | Nursing .. | |
| 15430 | ,, J. Pollock .. | | General Duty | |
| 15537 | ,, F. Booth .. | | ,, ,, | |
| 15585 | ,, H. Latter .. | | Nursing .. | |
| 15737 | ,, A. E. Thompson | | ,, .. | |
| 19436 | ,, H. Worbis .. | | ,, .. | |

**Appointments.**—The following appointments will take effect from the dates specified, to complete the Establishment authorised for 1908-09:—

*To be Lance-Serjeants (as Dispensers).*

| No. | Rank and Name | Date | Section | Remarks |
|---|---|---|---|---|
| 12129 | Corpl. S. M. Barnes .. | 1.10.08 | General Duty | To complete Establishment, 1908-09.<br>* Supernumerary with Egyptian Army. |
| 15312 | ,, G. Gillespie .. | | ,, ,, | |
| 11700 | ,, M. Stroud .. | | ,, ,, | |
| 18604 | ,, W. Tindall .. | | Nursing .. | |
| 12926 | ,, A. D. Gordon .. | | Clerical .. | |
| 18122 | ,, J. A. Kirby * .. | | ,, .. | |
| 18678 | ,, L. S. Ellis .. | | Nursing .. | |
| 18940 | ,, P. H. Musgrave .. | | Q.A.I.M.N.S. | |
| 12583 | ,, H. Ebbs .. .. | | Clerical .. | |

*To be Lance-Corporals.*

| | | | | |
|---|---|---|---|---|
| 19029 | Private R. E. Harvey .. | 2.7.08 | General Duty | Special under para. 281, S.O. |
| 11064 | ,, F. Slattery .. | 1.10.08 | Cooking .. | To complete Establishment, 1908-09. |
| 11392 | ,, E. Conner .. | | Nursing .. | |
| 12384 | ,, T. W. Burnhill .. | | General Duty | |
| 12518 | ,, H. Gale .. .. | | ,, ,, | |
| 12618 | ,, W. A. Mayman .. | | Nursing .. | |
| 12947 | ,, M. Henderson .. | | Clerical .. | |
| 13018 | ,, G. Turner .. | | Nursing .. | |
| 13035 | ,, G. V. Chandler .. | | ,, .. | |
| 16196 | ,, A. A. Tomley .. | | Clerical .. | |
| 16882 | ,, G. J. Short .. | | Nursing .. | |
| 17303 | ,, A. Auchterlonie | | ,, .. | |
| 17317 | ,, J. C. Reynolds .. | | Clerical .. | |
| 17358 | ,, C. Ennor .. | | Superintending Cook .. | |
| 17368 | ,, J. E. Skennell .. | | General Duty | |
| 17385 | ,, W. Thornton .. | | Nursing .. | |
| 17390 | ,, R. Cowx .. | | 1st Class Clerk | |
| 17413 | ,, E. Tweed .. | | General Duty | |
| 17464 | ,, N. J. Emery .. | | Superintending Cook .. | |
| 17465 | ,, J. Bell .. .. | | Superintending Cook .. | |
| 17450 | ,, W. J. Elsey .. | | General Duty | |
| 17496 | ,, C. Browne .. | | Cooking .. | |
| 17497 | ,, F. Gengo .. | | ,, .. | |
| 17513 | ,, J. Gallivan .. | | General Duty | |
| 17553 | ,, J. R. Morfitt .. | | 1st Class Clerk | |

**Nursing Section.**—The following appointments to the Nursing Section of the Corps will take effect from the dates specified:—

| No. | Rank and Name | Date | No. | Rank and Name | Date |
|---|---|---|---|---|---|
| 12266 | Serjt. H. Parker | 1.4.07 | 19749 | Pte. J. Reynolds | 25.8.08 |
| 18864 | Pte. J. Thorburn | 6.7.08 | 581 | ,, H. O. Edmond | 2.9.08 |
| 1868 | ,, A. Bunker | | 1061 | ,, J. F. McSweeney | |
| 1435 | ,, J. Brookes | | 969 | ,, H. A. McAllister | 8.9.08 |
| 1439 | ,, W. D. Ramsay | | 19469 | ,, H. D. Purnell | 12.9.08 |
| 17679 | ,, S. Hockley | 14.7.08 | 19916 | ,, H. J. Carroll | 14.9.08 |
| 179 | ,, A. E. Roe | | 1856 | ,, J. H. Beattie | 21.9.08 |
| 1348 | ,, S. G. Abboss | 16.7.08 | 1383 | ,, J. Rouse | |
| 1369 | ,, B. L. Earle | | 1400 | ,, E. Bamber | |
| 1060 | ,, A. J. Burrell | 20.7.08 | 1421 | ,, W. Rooney | |
| 1255 | ,, W. Hutton | 21.7.08 | 1481 | ,, L. Larkin | |
| 1418 | ,, G. J. Gentry | 27.7.08 | 1502 | ,, F. Bennison | |
| 1475 | ,, W. J. Bamford | | 1560 | ,, W. A. Ansley | |
| 1539 | ,, F. G. Catlin | | 1612 | ,, W. Boyd | |
| 1190 | ,, S. Handasyde | 28.7.08 | 1679 | ,, A. Gray | |
| 17123 | ,, W. H. Sawyer | 3.8.08 | 15009 | ,, W. Williams | 24.9.08 |
| 18136 | ,, H. Day | 13.8.08 | 19823 | ,, T. J. Kilyon | |
| 17899 | ,, W. E. Dyke | 14.8.08 | 19698 | ,, M. Wass | 28.9.08 |
| 19030 | ,, R. S. Mann | | 418 | ,, B. Horsfall | 29.9.08 |
| 1355 | ,, J. Wilson | | 998 | ,, W. J. Rawlings | |
| 1393 | ,, A. Vear | | 1131 | ,, F. V. Burge | |
| 1423 | ,, T. Atkinson | | 1690 | ,, G. Hargreaves | |
| 9903 | Serjt. R. T. Pack | 20.8.08 | | | |

**Buglers.**—The following Boys are appointed Buglers from the dates specified: 306 F. G. Quelch, July 29, 1908; 1464 J. Fitzgerald, July 29, 1908.

**Advancement of Privates (Corps Pay).**—The following advancements in rate of Corps Pay will take effect from October 1, 1908:—

*To be Advanced to the Third Rate of Corps Pay (at 8d.).*

*As Orderlies.*

| No. | Name | No. | Name | No. | Name |
|---|---|---|---|---|---|
| 14768 | Peavoy, A. | 18873 | Spiers, W. J. | 217 | O'Shea, T. |
| 14701 | Wright, H. J. | 19460 | Payne, C. J. T. | 407 | Budd, A. |
| 17815 | Frum, W. E. J. | 113 | Powell, J. D. | 518 | Norrie, E. S. |
| 17825 | Moore, N. | | | | |

*As Clerks.*

| | | | |
|---|---|---|---|
| 19121 | Cook, T. | 19126 | Perkins, F. H. |

*To be Advanced to the Fourth Rate of Corps Pay (at 6d.).*

*As Orderlies.*

| | | | | | |
|---|---|---|---|---|---|
| 135 | Ponting, F. J. | 909 | Lockyer, F. G. | 989 | Moore, R. S. |
| 160 | Pettit, V. | 918 | Nelson, W. | 1033 | O'Shea, W. |
| 223 | Peake, W. | 935 | Griffith-Williams, H. M. | 1070 | Harwood, G. H. |
| 504 | Barnett, D. | | | 1072 | French, H. A. |
| 881 | David, H. | | | | |

*As Clerks.*

| | | | | | |
|---|---|---|---|---|---|
| 16914 | Holmes, S. | 96 | McMurdo, E. L. | 397 | Young, L. R. |
| 18571 | Pepper, F. T. | 266 | George, W. E. | 1014 | Weber, W. |
| 19595 | Bull, C. E. | | | | |

*As Cooks.*

| | | | | | |
|---|---|---|---|---|---|
| 12818 | Magee, W. | 17711 | Holland, D. C. | 17745 | Bailey, H. |

**Advancement of Privates (Corps Pay).**—The advancement to the Fourth Rate of Corps Pay at 6d., as a Clerk, of 18202 Private J. W. G. Hinton, notified in Corps Order No. 29, of 1908, is hereby cancelled.

**Sanitary Orderlies (Corps Pay).**—The following Privates are advanced to the Fourth Rate of Corps Pay at 6d., as Sanitary Orderlies, in accordance with Office Letter, No. R.O./31/13, dated December 17, 1906, from the dates specified:—

| No. | Name | Date | No. | Name | Date |
|---|---|---|---|---|---|
| 19737 | Clinton, A. .. .. | 1.5.08 | 114 | Snow, W. J... .. | 16.7.08 |
| 19496 | Pettit, H. .. .. | 1.6.08 | 19265 | Armstrong, F. .. | 1.8.08 |
| 17003 | Keeley, C. R. .. | 21.6.08 | 1500 | Boccins, H. A. .. | 21.9.08 |
| 943 | Ball, A. H. .. .. | 10.7.08 | 1591 | Ince, J. .. .. | 23.9.08 |
| 873 | Crook, W. .. .. | | 1410 | Pratt, J. R. .. .. | 26.9.08 |
| 142 | Sharpe, G. F. .. | | 1657 | Gelder, H. .. .. | 28.9.08 |
| 12178 | Knight, D. C. H. .. | 13.7.08 | 699 | Wilkins, A. S. .. | |

## N.C.O.'s AND MEN QUALIFIED AS DISPENSERS.

| No. | Rank and Name | No. | Rank and Name |
|---|---|---|---|
| 12819 | Cpl. W. H. Riches | 14761 | Lce.-Cpl. W. Robertson |
| 10436 | ,, F. Evans | 11327 | Cpl. M. K. Quinlan |
| 12617 | ,, J. R. Edwards | 17381 | ,, A. Gray |
| 16190 | Lce.-Cpl. J. R. Cowling | 18969 | ,, E. Gray |
| 17844 | Cpl. W. A. Clenshaw | 16205 | ,, T. Gregson |
| 2609 | ,, W. K. Lethbridge (1st Life Guards) | 17785 | ,, G. L. Shore |
| 18801 | ,, G. H. Wolfe | 13194 | ,, W. F. Avery |
| 13361 | ,, P. J. Le Page | 751 | Pte. A. J. Milne |
| 12261 | ,, J. E. Green | 586 | ,, W. A. Gordon |
| 18613 | ,, C. F. Grant | 11117 | Cpl. W. Griffiths |
| 19446 | Pte. D. Davies | 17180 | ,, E. A. Norwood |
| 12053 | Cpl. W. Ross | 18850 | ,, G. W. Eagles |
| 19396 | Pte. H. Baker | 14209 | Lce.-Cpl. A. McCune |
| 11789 | Cpl. W. Skinner | 18185 | Pte. W. C. H. Mayo |
| 16053 | ,, S. M. Gawthorne | 15843 | Cpl. W. Stokes |
| 13664 | ,, J. C. Dunn | 17513 | Pte. J. Gallivan |
| 19322 | Pte. H. Elliott | 754 | ,, H. Russell |

**NOTES FROM NO. 14 COMPANY, ROYAL ARMY MEDICAL CORPS, DUBLIN.**—Serjeant T. M. Maxwell writes (October 26, 1908): "The members of the Serjeants' Mess, No. 14 Company, Royal Army Medical Corps, held a Smoking Concert on the evening of October 9, to entertain the members of the permanent staff of the late Nos. 1 and 2 Dublin Companies, Royal Army Medical Corps (Militia), prior to their departure to serve with Territorial units. During the course of the evening the various members helped to make the occasion as pleasurable as possible by contributing song, recitation and yarn. The guests of the evening were Serjeants Buckley, Maffey, and Tasker, all of whom have since left us, proceeding respectively to Cardiff, Wolverhampton, and Aberdeen. Serjeant-Major Stanley, who presided, in a few appropriate words made a suitable presentation to each of the guests on behalf of the members of the Mess. All three feelingly replied, and expressed their regret in having to leave their many worthy and trusted brother N.C.O's. 'Auld Lang Syne' and the National Anthem brought a memorable and happy evening to a close at 11 p.m.

"The Serjeants of No. 14 Company have started a Hockey Club, and through the encouragement of the Commanding Officer and Officers have furnished themselves with the necessary paraphernalia in the way of clothing and gear. They have played two matches, one against the Serjeants of the Royal Scots Fusiliers, and the other against the Serjeants of the 2nd Wiltshire Regiment. Although defeats are registered in each instance, still, having regard to the fact that nearly all our players are novices at the game, there is credit due for the plucky fights made, and it is certain that ere long some victories will be credited to our side."

**NOTES FROM MALTA.**—Major C. E. Pollock writes (November 6, 1908): "A meeting of the most pleasant nature took place at Valletta Hospital on Friday evening, October 9, where all the N.C.O.'s of the Corps assembled at a "Supper and Social" given by the members of Valletta and Cottonera Serjeants' Messes, in honour of arriving and departing comrades. Quartermaster-Serjeant Chappell had charge of the arrangements, and, with the assistance of Corporal Chipperfield, who performed the duties of chef, an elegant display of culinary art was achieved. The tables presented a very picturesque appearance; ferns and fresh-cut flowers were ingeniously intermingled, and combined, with the artistically decorated room, made one feel welcome on entering. Our best thanks are due to Mrs. Chappell and Mrs. Chipperfield for the tasteful arrangements.

"The menu comprised the following: Thick ox-tail soup; fried fish and chipped potatoes; roast sirloin of beef, horseradish sauce; potatoes and cauliflower; boiled capon, white sauce, ham and tongue; cabinet pudding and wine sauce; trifle; cheese; dessert. It was thoroughly appreciated, as was evidenced by the state of the outgoing dishes.

"The tables having been cleared, the concert began, the chair being taken by Serjeant-Major Dudman.

"PROGRAMME.

TOAST—"The King."

| | | |
|---|---|---|
| *Musical Selection* | "Cavalleria Rusticana" | Mr. Buhagiar's Band. |
| *Song* | "Asleep in the Deep" | Corporal Myatt. |
| *Song* | "It's English, you know" | Serjeant Kirby. |
| | TOAST—"Our Departing Comrades."<br>RESPONSE. | |
| *Selection* | "The Belle of New York" | Mr. Buhagiar's Band. |
| *Song* | "The Jockey" | Lieutenant Pilgrim. |
| *Song* (*Comic*) | "Stop your tickling, Jock" | Qmr.-Serjt. Gillespie. |
| *Song* | "I'll be a Soldier, too" | Serjeant Davies. |
| | TOAST—"Our New Comrade."<br>RESPONSE. | |
| *Song* | "Out on the Deep" | Staff-Serjeant Jones. |
| *Song* (*Comic*) | "Mrs Brown's Luggage" | Serjeant Gray. |
| *Song* | "Star of my Soul" | Corporal Chipperfield. |
| *Song* | "In Friendship's Name" | Serjeant Kirby. |
| *Selection* | "The Merry Widow" | Mr. Buhagiar's Band. |
| | TOAST—"OUR OFFICERS."<br>RESPONSE. | |
| *Song* | "Eileen Alannah" | Corporal Myatt. |
| *Song* | "The Shipwrecked Captain" | Lieutenant Pilgrim. |
| *Song* | "No. 9" | Qmr.-Serjt. Gillespie. |
| *Song* | "A Jovial Monk" | Staff-Serjeant Jones. |

"At the several toasts and responses which were made and given, Lieutenant-Colonel Russell, C.M.G., responding for the Officers, stated how pleased he was to be present at such a convivial gathering, and also that the remainder of the officers appreciated the invitation extended to them. He deplored the absence of Lieutenant-Colonel Jennings, our departing Commanding Officer, who had tendered his apologies, stating that a prior engagement would not permit of his being present. Continuing, he said that meetings such as these bound the Corps together in a state of good comradeship, and sincerely hoped they would continue. Upon the toast 'Our Departing Comrades' having been given, and their health having been drunk, Serjeant-Major Lowe rose and said how really sorry he was to leave so many good friends, and he was sure that his feelings were echoed by Staff-Serjeant Underwood and Serjeants Jarvis and Davies, who were likewise shortly about to leave. There was only one thing he wished for, and that was for all, if possible, to be stationed together some future time. Serjeant-Major Lowe, who is very popular here, sat down amidst a hurricane of cheers. Quartermaster-Serjeant Gillespie, in responding to the toast 'Our New Comrade,' said that he could not express how deeply he felt the welcome that had been given him. He had left a good many friends behind at Aldershot, but had evidently dropped upon as good in Malta. The end came about 11.30 p.m., and, to the accompaniment of 'Auld Lang Syne,' the first concert of its kind of the Corps in Malta concluded.

"A few words are due to Quartermaster-Serjeant Chappell, who organised the whole affair, and the novelty he supplied in the shape of a 'Menu and Programme Card does him great credit, because it was eagerly seized as a souvenir of a most pleasant evening."

**NOTES FROM SIMLA.**—Lieutenant-Colonel R. S. F. Henderson, Secretary to Principal Medical Officer, His Majesty's Forces in India, writes (October 15, 1908) :—

"The Royal Army Medical Corps officers shown in the attached list have been (I) posted to the command of station hospitals, and (II), nominated for transfer to and from Burma during next cold weather.

### I.—To Command Station Hospitals.

| Rank and name | Name of Station Hospital to which appointed | Date from which appointment takes effect |
|---|---|---|
| *Northern Army.* | | |
| Lieut.-Col. M. W. O'Keefe | Rawal Pindi | February 10, 1908. |
| ,, F. P. Nichols | Peshawar | March 1, 1908. |
| ,, H. H. Brown | Nowshera | December 20, 1907. |
| ,, B. M. Skinner, M.V.O. | Sialkot | ,, |
| ,, E. Butt | Lahore Cantonment | October 14, 1908, or on arrival from England. |
| ,, T. Daly | Ferozepore | October 10, 1907. |
| ,, J. Carmichael | Jullundur | January 18, 1906. |
| ,, M. O. D. Braddell | Amballa | February 9, 1909. |
| ,, F. J. Jencken | Meerut | April 4, 1907. |
| ,, T. B. Winter | Bareilly | October 31, 1906. |
| ,, H. N. Thompson, D.S.O. | Lucknow | January 6, 1909, or on arrival from England. |
| ,, H. A. Haines | Fyzabad | February 20, 1908. |
| ,, E. H. Lyden-Bell | Allahabad | ,, |
| ,, W. B. Thomson | Calcutta | January 1, 1908. |
| ,, G. E. Hale, V.H.S. | Murree | March 1, 1908. |
| ,, W. C. Beevor, C.M.G. | Dalhousie | ,, |
| Major T. W. Gibbard | Dagshai | March 1, 1909. |
| Capt. A. J. Hull | Jutogh | March 1, 1908. |
| Major (Bt.-Lieut.-Col.) O. R. A. Julian, C.M.G. | Kasauli | September 24, 1908. |
| ,, H. W. K. Read | Landour | March 1, 1909. |
| Lieut.-Col. L. T. M. Nash | Ranikhet | ,, |
| ,, W. T. Swan | Chakrata | March 1, 1908. |
| ,, J. M. F. Shine | Naini Tal | December 10, 1908. |
| ,, W. W. Pike, D.S.O. | Darjeeling | March 1, 1908. |
| Major T. McCulloch | Lebong | March 15, 1908. |
| *Southern Army.* | | |
| Lieut.-Col. T. J. O'Donnell, D.S.O. | Quetta | October 31, 1905. |
| ,, R. L. R. McLeod | Karachi | February 22, 1908. |
| ,, S. Westcott, C.M.G. | Mhow | March 7, 1907. |
| ,, J. S. Green | Nasirabad | November 8, 1908. |
| ,, R. J. Geddes, D.S.O. | Jubbulpore | On arrival from England. |
| ,, H. P. G. Elkington | Jhansi | December 1, 1908. |
| ,, H. S. McGill | Poona | April 1, 1907. |
| ,, C. T. Blackwell | Belgaum | February 24, 1907. |
| ,, G. F. Gubbin | Colaba | March 25, 1906. |
| ,, S. C. B. Robinson | Ahmednagar | October 26, 1906. |
| ,, T. J. R. Lucas | Bangalore | December 4, 1906. |
| ,, G. Cree | Madras | March 15, 1908. |
| ,, J. Battersby | Secunderabad | March 27, 1907. |
| ,, S. F. Freyer, C.M.G. | Maymyo | September 1, 1908. |
| ,, P. C. H. Gordon | Rangoon | March 4, 1907. |
| Major A. Burnside | Mount Abu | November 25, 1908. |
| Lieut.-Col. J. R. Stuart | Pachmarhi | September 24, 1908. |
| ,, H. Cocks | Wellington | March 15, 1908. |

### II.—To be Transferred from Burma (1908-9).

| Rank and name of Officer | Division to which posted | Remarks |
|---|---|---|
| Major St. J. Killery | 7th (Meerut) | Bareilly, for duty. |
| Capt. T. J. Wright | 8th (Lucknow) | Lebong, for duty during summer of 1909. |
| Lieut. G. Ormrod | 7th (Meerut) | Landour, for duty during summer of 1909. |

### For Duty in Burma (1908-9).

| Rank and name of Officer | From whence detailed | Remarks |
|---|---|---|
| Lieut.-Col. S. F. Freyer, C.M.G. | 9th (Secunderabad) Division | Maymyo, to command Station Hospital. |
| ,, W. H. Starr | ,, | |
| Capt. G. M. Goldsmith | England. | |
| ,, T. E. Harty | 8th (Lucknow) Division. | |
| ,, R. H. MacNicol | 9th (Secunderabad) Division. | |
| Lieut. W. B. Purdon | England. | |

"*Appointments.*—The following appointments of Staff Officers, Divisional Medical Mobilisation Stores, are sanctioned: Captain C. R. Sylvester Bradley, to be transferred from 6th (Poona) to 7th (Meerut) Division, for appointment, *vice* Captain E. B. Knox, R.A.M.C., who embarks for home on December 18, 1908, as tour expired. Captain G. B. Crisp to be transferred from 7th (Meerut) to 5th (Mhow) Division, for appointment, *vice* Major T. A. Grainger, I.M.S., who will be transferred to 6th (Poona) Division, *vice* Captain J. F. Martin, R.A.M.C., proceeding home, tour expired, on December 8, 1908.

"*Leave.*—The following officers have been granted extension of medical certificate leave ex-India: Captain T. H. M. Clarke, C.M.G., D.S.O., from September 24, 1908, to December 23, 1908; Lieutenant T. S. Blackwell, from September 5, 1908, to October 16, 1908; Captain M. Sinclair, from September 26, 1908, to November 25, 1908.

"*Postings.*—Officers coming out from England during the ensuing trooping season in relief of tour-expired officers are posted to Divisions, as shown in the following list:—

"Officers of the rank of Lieutenant will first proceed to the stations given below to undergo one month's instruction in sanitation: From 1st (Peshawar), 2nd (Rawal Pindi), and 3rd (Lahore) Divisions to Rawal Pindi; from 4th (Quetta) Division to the Divisional Headquarters, *i.e.*, Quetta; from 5th (Mhow) and 6th (Poona) Divisions to Poona; from 7th (Meerut) and 8th (Lucknow) Divisions to Lucknow; from 9th (Secunderbad) and Burma Divisions to Bangalore.

"1st (Peshawar) Division: Major J. C. Weir, D.P.H.; Captain J. S. Gill.

"2nd (Rawal Pindi) Division: Lieutenant-Colonel H. J. Fletcher; Major M. P. C. Holt; Captain B. Watts; Lieutenants A. C. Elliott, E. M. Middleton, D. T. McCarthy.

"3rd (Lahore) Division: Lieutenant-Colonel E. Butt, to Command Station Hospital, Lahore Cantonment; Lieutenant-Colonel M. O. D. Braddell, to Command Station Hospital, Ambala; Lieutenant-Colonel W. B. Day; Majors S. H. Withers, E. C. Anderson, D.S.O., A. S. Thompson, D.P.H., S. A. Archer, F. J. Morgan; Captain B. F. Wingate; Lieutenants A. H. Heslop, D. H. Corbett, W. E. C. Lunn, W. W. Boyce, F. D. Bradish, C. W. Bowle, T. H. Scott, W. Mitchell (with 2nd Liverpool Regiment), O. R. McEwen.

"4th (Quetta) Division; Majors J. Girvin, C. W. S. Whitestone; Captains W. P. Gwynn, J. Matthews, H. Herrick; Lieutenant J. J. O'Keefe.

"5th (Mhow) Division: Lieutenant-Colonel R. J. Geddes, D.S.O., to Command Station Hospital, Jubbulpore; Majors G. W. R. Realey, M. Swabey, R. F. E. Austin, E. W. Bliss; Captain J. H. Barbour; Lieutenants E. B. Lathbury, J. R. Foster, T. W. Browne, Jou. P. Langrishe (with 5th Dragoon Guards).

"6th (Poona) Division: Majors F. J. Wade Browne, S. W. Sweetham; Captains

H. K. Palmer, H. M. Nicholls, H. F. Shea; Lieutenants C. Scaife, O. C. P. Cooke, J. A. Bennett, H. A. Howell.

"7th (Meerut) Division; Major H. J. Pocock; Captains J. D. S. Macpherson, L. E. L. Parker; Lieutenants D. Coutts, A. C. Amy (with 1st Royal Scots), J. L. Wood (4th Worcester Regiment).

"8th (Lucknow) Division: Lieutenant-Colonels W. A. Morris, H. N. Thompson, D.S.O. (to command Station Hospital, Lucknow), A. T. Lilly; Majors R. J. Blackham, D.P.H., F. E. Gunter; Captains P. S. O. Reilly, W. R. Blackwell, A. H. Safford; Lieutenants W. F. Loughnan, W. J. Thompson, E. C. Phelan, C. H. Denyer, F. S. Casement, R. D. O'Connor.

"9th (Secunderabad) Division: Lieutenant-Colonel S. Powell; Majors J. W. Bullen, J. C. Connor, D. D. Shanahan, E. W. Slayter; Captains E. T. Inkson, V.C., E. F. Q. L'Estrange; Lieutenants M. J. Lochrin, E. D. Caddell, G. P. A. Bracken, C. Kelly, G. F. Rudkin, H. W. Farebrother, M. O. Wilson, B. Johnson.

"Burma Division: Captain G. M. Goldsmith; Lieutenant W. B. Purdon.

"*Transfers.*—The following transfers of officers from one Division to another are sanctioned: Lieutenant-Colonel H. M. Adamson, on relief to be transferred from 7th (Meerut) to 8th (Lucknow) Division; Major B. J. Innis, from 8th (Lucknow) to 7th (Meerut) Division; Major J. B. Anderson, from 7th (Meerut) to 8th (Lucknow) Division; Captain M. C. Wetherell, from 2nd (Rawal Pindi) to 7th (Meerut) Division, on arrival of Lieutenant D. T. McCarthy in the former Division from England; Captain W. M. MacDowall, from 5th (Mhow) to 3rd (Lahore) Division; Lieutenant A. H. Jacob, from 3rd (Lahore) to 2nd (Rawal Pindi) Division."

**NOTES FROM SOUTH AFRICA.**—Major J. McMunn writes (November 2, 1908): "The following moves amongst officers of the Royal Army Medical Corps have taken place: Lieutenant-Colonel M. O'Halloran, to Cape Town, from Army Headquarters, Pretoria; Lieutenant-Colonel W. Heffernan, to Middelburg, C.C., from Cape Town; Lieutenant-Colonel N. C. Ferguson, to Simon's Town, from Middelburg, C.C.; Major W. E. Hardy, to Wynberg, C.C., from Pretoria; Major S. F. Clark, to Middelburg, C.C., from Bloemfontein; Lieutenant T. W. O. Sexton, from Potchefstroom to Pretoria.

"The undermentioned officers embarked for England, 'Tour Expired': Major H. W. H. O'Reilly, ss. "Avondale Castle," September 7, 1908; Captain J. E. H. Gatt, ss. 'Avondale Castle,' September 7, 1908; Lieutenant-Colonel F. H. M. Burton, ss. 'Galician,' September 10, 1908; Captain L. Addams-Williams, ss. 'Galician,' September 10, 1908; Major T. J. Lenehan, ss. 'Goorkha,' October 26, 1908; Captain F. W. W. Dawson, ss. 'Goorkha,' October 26, 1908.

"The undermentioned officers, on arrival off leave, have been posted to stations as under: Major J. E. Carter, Pretoria; Captain E H. M. Moore, Potchefstroom.

"The undermentioned officer has been granted sick leave in extension from October 1, 1908, to March 31, 1909: Lieutenant and Quartermaster W. G. Holway.

"The following changes have taken place amongst the Queen Alexandra's Imperial Military Nursing Service: Principal Matron Miss A. Garriock, R.R.C., to England, on sick leave; Matron Miss H. W. Reid, to England; Matron Miss A. L. Cox, to Pretoria, from Wynberg, C.C.; Matron Miss C. Hutton Potts, to Wynberg, C.C., on arrival off sick leave from England. Sister Miss E. M. Denne, to Harrismith, as Acting Matron, from Bloemfontein; Sister Miss M. Wright, granted leave to England; Sister Miss L. M. Lyall, resigned appointment Q.A.I.M.N.S., to England, September 15, 1908.

"NAMES OF CANDIDATES WHO QUALIFIED IN THE EXAMINATION FOR ARMY FORM C. 344, HELD IN MAY LAST.

| No. | Name and rank | Percentage of marks | No. | Name and rank | Percentage of marks |
|---|---|---|---|---|---|
| 19665 | Private H. G. Boxall | 79 | 18727 | Private T. M. Lewis.. | 70 |
| 19497 | ,, J. K. Jackson | 77 | 19746 | ,, W. F. Dodwell | 70 |
| 19734 | ,, H. F. Peters | 77 | 17681 | ,, W. J. Hooper | 66 |
| 19032 | ,, J. Cooke .. | 76 | 19700 | ,, C. F. Hopwood | 64 |
| 15683 | ,, T. P. Dent .. | 73 | 18254 | ,, A. W. Wright | 61 |
| 19070 | ,, H. Siddall .. | 73 | 18958 | ,, S. J. Cousins | 60 |
| 18964 | ,, G. W. Herbert | 72 | 19054 | ,, C. Evans .. | 60 |
| 18039 | Corpl. P. Wood .. | 71 | | | |

"The total number examined was seventeen; ten of these were from 23rd Company, all of whom passed.

"At a Shooting Competition between the Army Headquarters Rifle Club and the Transvaal Medical Volunteers on October 25, the special prize for the highest individual score was won by No. 14505 Serjeant H. Jones, R.A.M.C., of the former team.

' "On November 1, Lord Methuen, General Officer Commanding-in-Chief, South Africa, unveiled a Memorial in the Pretoria Cemetery to the memory of those who fell in the Boer War, 1880-81. Among the names on the Memorial were: Private George Linnet, Army Hospital Corps; Private W. Lovell, Army Hospital Corps; Private William Humphrey, Army Hospital Corps."

## ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant-Colonel Edward A. Rawson, having reached the prescribed limit of age, ceases to belong to the Army Medical Reserve of Officers, dated September 27, 1908.

His Majesty the King has been graciously pleased to approve of the disbandment of the Army Medical Reserve of Officers, as constituted by the Royal Warrant of 1888, dated War Office, October 27, 1908.

Surgeon-Lieutenant-Colonel Quinton Chalmers, M.D., having resigned his commission in the Volunteers, ceases to belong to the Army Medical Reserve of Officers, dated January 21, 1908.

## MILITIA.

### INFANTRY.

*8th Battalion the King's Royal Rifle Corps.*—Surgeon-Lieutenant-Colonel Edward A. Rawson retires, with permission to retain his rank and to wear the prescribed uniform, dated September 27, 1908.

## ROYAL ARMY MEDICAL CORPS.

His Majesty the King has been graciously pleased to approve of the disbandment of the Royal Army Medical Corps (Militia), dated October 20, 1908.—*London Gazette*, October 20, 1908.

## TERRITORIAL FORCE.

### YEOMANRY.

Surgeon-Lieutenant Maurice Were Coleman, M.D., from the Berks Imperial Yeomanry, to be Surgeon-Lieutenant, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Hampshire (Carabiniers).*—Surgeon-Captain Henry Augustus Ahrens, from the Hampshire (Carabiniers) Imperial Yeomanry, to be Surgeon-Captain, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*West Kent (Queen's Own).*—The undermentioned officer, from the West Kent (Queen's Own) Imperial Yeomanry, is appointed to the Regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908:—

Surgeon-Captain Gardiner William Trouton, M.D.

*Northumberland.*—The undermentioned officers, from the Northumberland (Hussars) Imperial Yeomanry, are appointed to the Regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908:—

Surgeon-Major Arthur Brumell.
Surgeon-Lieutenant Hamilton Drummond, M.B.

*Yorkshire Dragoons (Queen's Own).*—Surgeon-Major Percy Bernard Mackay, from the Yorkshire Dragoons (Queen's Own) Imperial Yeomanry, to be Surgeon-Major, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Yorkshire Hussars (Alexandra, Princess of Wales's Own).*—Surgeon-Captain Walter Henry Cheetham, M.D., from the Yorkshire Hussars (Alexandra, Princess of Wales's Own) Imperial Yeomanry, to be Surgeon-Captain, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Denbighshire Hussars.*—Surgeon-Lieutenant Richard Geoffrey Williams, from the Denbighshire (Hussars) Imperial Yeomanry, is appointed to the Regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Royal East Kent (The Duke of Connaught's Own).*—Surgeon-Lieutenant Campbell Tilbury Fox, from the Royal East Kent (The Duke of Connaught's Own) Imperial Yeomanry, to be Surgeon-Lieutenant, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Shropshire.*—Surgeon-Lieutenant-Colonel John Daniel Lloyd, from the Shropshire Imperial Yeomanry, to be Surgeon-Lieutenant-Colonel, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Sussex.*—Surgeon-Lieutenant John Robert Steinhausen, M.B., from the Sussex Imperial Yeomanry, to be Surgeon-Lieutenant, with precedence as in the Imperial Yeomanry, dated April 1, 1908.

*Lancashire Hussars.*—The undermentioned officer, from the Lancashire Hussars Imperial Yeomanry, is appointed to the Regiment, with rank and precedence as in the Imperial Yeomanry, dated April 1, 1908:—

Surgeon-Captain John Tawse Nisbet.

### ROYAL FIELD ARTILLERY.

*1st South Midland Brigade.*—The undermentioned officers, from the 1st Gloucestershire (Gloucester and Somerset) Royal Garrison Artillery (Volunteers), are appointed to the Brigade, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Walter James Hill.

Surgeon-Captain James Richard Bibby, M.B.

*3rd East Lancashire Brigade.*—Surgeon-Major Alexander Cosgrave, from the 9th Lancashire Royal Garrison Artillery (Volunteers), to be Surgeon-Major, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th West Lancashire (Howitzer) Brigade.*—The undermentioned officer, from the 4th Lancashire Royal Garrison Artillery (Volunteers), is appointed to the Brigade, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Thomas Frederick Young, M.D.

*1st Welsh (Howitzer) Brigade.*—The undermentioned officers, from the 1st Glamorganshire Royal Garrison Artillery (Volunteers), are appointed to the Brigade, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain David Arthur Davies, M.B.

Surgeon-Captain Francis Griffith Thomas.

The undermentioned officer, from the 1st Monmouthshire Royal Garrison Artillery (Volunteers), is appointed to the Brigade, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant John O'Keefe.

### ROYAL HORSE ARTILLERY.

*1st City of London (Honourable Artillery Company).*—The undermentioned officer, from the Honourable Artillery Company of London, is appointed to the Battery, with rank and precedence as in the Honourable Artillery Company of London, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Richard James Reece, M.D.

*2nd City of London (Honourable Artillery Company).*—The undermentioned officer, from the Honourable Artillery Company of London, is appointed to the Battery, with rank and precedence as in the Honourable Artillery Company of London, dated April 1, 1908:—

Surgeon-Captain John Francis Taylor.

*26th Battalion the City of London Regiment (Honourable Artillery Company).*—The undermentioned officer, from the Honourable Artillery Company of London, is appointed to the Battalion, with rank and precedence as in the Honourable Artillery Company of London, dated April 1, 1908:—

Surgeon-Captain Edward Herbert Myddelton-Gavey.

*Shropshire.*—The undermentioned officer, from the Shropshire and Staffordshire Royal Garrison Artillery (Volunteers), is appointed to the Battery, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain George Mackie, M.B.

### ROYAL GARRISON ARTILLERY.

*Devonshire.*—Supernumerary Major Charles Wilson Blundell is absorbed into the Establishment, dated April 1, 1908.

Surgeon-Captain James P. S. Ward to be Surgeon-Major, dated April 6, 1908.

*East Lancashire.*—The undermentioned officer, from the 8th Lancashire Royal Garrison Artillery (Volunteers), is appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Arthur Richard Hopper.

The undermentioned officer, from the 2nd Sussex Royal Garrison Artillery (Volunteers), is appointed to the Unattached List, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Henry Habgood, M.D.

## ROYAL ENGINEERS.

*Headquarters, 2nd London Divisional Engineers.*—Surgeon-Lieutenant James Herbert Rhodes, M.D., from the 1st Middlesex Royal Engineers (Volunteers), to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*Headquarters, West Riding Divisional Engineers.*—The undermentioned officers, from the 1st (Sheffield) Yorkshire (West Riding) Royal Engineers (Volunteers) are appointed to the West Riding Divisional Engineers, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Alan Charles Turner.

Surgeon-Lieutenant Joseph Mitchell Benson, M.B.

## INFANTRY.

*7th Battalion the Northumberland Fusiliers.*—The undermentioned officers, from the 1st Volunteer Battalion the Northumberland Fusiliers, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major William Bertie Mackay, M.D.

Surgeon-Lieutenant Charles George Maclagan, M.B.

*5th* and *6th Battalions the Royal Warwickshire Regiment.*—Surgeon-Major Richard Arthur Newton, from the 1st Volunteer Battalion the Royal Warwickshire Regiment, to be Surgeon-Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain George Henry Ernest Bckenn, from the 1st Volunteer Battalion the Royal Warwickshire Regiment, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th Battalion the Gloucestershire Regiment.*—Surgeon-Lieutenant John Alexander Nixon, from the 1st (City of Bristol) Volunteer Battalion the Gloucestershire Regiment, to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*7th Battalion the Worcestershire Regiment.*—The undermentioned officers, from the 1st Volunteer Battalion the Worcestershire Regiment, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Joseph Robinson.

Surgeon-Captain Bertram Addenbrooke, M.D.

*8th Battalion the Worcestershire Regiment.*—Surgeon-Lieutenant Hubert Rodney Ross Fowler, M.D., from the 2nd Volunteer Battalion the Worcestershire Regiment, to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*5th Battalion (Cinque Ports) Royal Sussex Regiment.*—The undermentioned officers, from the 1st Cinque Ports Volunteer Rifle Corps, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant Alfred Alexander.

Surgeon-Lieutenant Peter Millar Waugh, M.B.

*4th Battalion the Oxfordshire Light Infantry.*—The undermentioned officers, from the 2nd Volunteer Battalion the Oxfordshire Light Infantry, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Julius Ottaway Sankey.

Surgeon-Lieutenant Hubert de Burghe Dwyer.

*The Buckinghamshire Battalion the Oxfordshire Light Infantry.*—Surgeon-Captain John Charles Baker, from the 1st Bucks Volunteer Rifle Corps, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*8th Battalion the Duke of Cambridge's Own (Middlesex Regiment).*—Surgeon-Lieutenant Thomas Christopher Cummins, from the 2nd Volunteer Battalion the Duke of Cambridge's Own (Middlesex Regiment) is appointed Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*5th Battalion Suffolk Regiment.*—Surgeon-Captain Sidney Hillier, M.D., from the 2nd Volunteer Battalion the Suffolk Regiment, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*The Hertfordshire Battalion the Bedfordshire Regiment.*—Surgeon-Lieutenant Arthur Herbert Foster, from the 1st (Herefordshire) Volunteer Battalion the Bedfordfordshire Regiment, to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*7th Battalion Cheshire Regiment.* -- The undermentioned officer, from the 5th Volunteer Battalion the Cheshire Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:

Surgeon-Major and Honorary-Surgeon-Lieutenant-Colonel John Herbert Hacking.

*The Brecknockshire Battalion the South Wales Borderers.*—The undermentioned officer from the 1st (Brecknockshire) Volunteer Battalion the South Wales Borderers, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain John Griffiths.

*5th Cumberland Battalion Border Regiment.*—Surgeon-Lieutenant William Marley-Cass, from the 3rd (Cumberland) Volunteer Battalion the Border Regiment, to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th Battalion Essex Regiment.*—Surgeon-Captain James Aitken, M.B., from the 1st Volunteer Battalion the Essex Regiment, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*9th Battalion Durham Light Infantry.*—Surgeon-Captain John Arthur Kendall, M.B., from the 5th Volunteer Battalion the Durham Light Infantry to be Surgeon-Captain with precedence as in the Volunteer Force, dated April 1, 1908.

*5th Battalion East Surrey Regiment.*—Surgeon-Captain John Edwin Bates, M.B., from the 2nd Volunteer Battalion the East Surrey Regiment, to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*15th Battalion County of London (Prince of Wales' Own Civil Service) Regiment.* —The undermentioned officers, from the Prince of Wales' Own 12th Middlesex (Civil Service) Volunteer Rifle Corps, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Thomas Hugh Dickson, M.B.

Supernumerary Surgeon-Lieutenant Robert Welsh Branthwaite. (To remain supernumerary.)

*4th Battalion the King's Own (Royal Lancashire Regiment).*—Surgeon-Captain Richard John Morris, from the 1st Volunteer Battalion the King's Own (Royal Lancashire Regiment), to be Surgeon-Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*5th Battalion the King's (Liverpool Regiment).*—The undermentioned officers, from the 1st Volunteer Battalion the King's (Liverpool Regiment), are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Keith Waldegrave Monsarrat, M.B.

Surgeon-Captain George Burton Robinson, M.D.

*8th (Irish) Battalion the King's (Liverpool Regiment).*—The undermentioned officer, from the 5th (Irish) Volunteer Battalion the King's (Liverpool Regiment), is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain John Mauries Ahern.

*10th (Scottish) Battalion the King's (Liverpool Regiment).*—The undermentioned officers, from the 8th (Scottish) Volunteer Battalion the King's (Liverpool Regiment), are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Charles John Macalister, M.D.

Surgeon-Lieutenant David Moore Alexander.

*5th Battalion the Lancashire Fusiliers.*—The undermentioned officers, from the 1st Volunteer Battalion the Lancashire Fusiliers, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Robert Mitchell, M.D. (since deceased).

Surgeon-Major Arthur Peel Nuttall, M.D.

Surgeon-Captain James Will Cook, M.B.

*5th Battalion the East Lancashire Regiment.* —The undermentioned officer, from the 2nd Volunteer Battalion the East Lancashire Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Richard Langford Fitz-Gerald.

*4th Battalion the Border Regiment.*—The undermentioned officer, from the 1st (Cumberland) Volunteer Battalion the Border Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major William Symington, M.B.

The undermentioned officer, from the 2nd (Westmoreland) Volunteer Battalion the Border Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel George William Brumwell.

*4th Battalion the Prince of Wales' Volunteers (South Lancashire Regiment).*—The undermentioned officers, from the 1st Volunteer Battalion the Prince of Wales' Volunteers (South Lancashire Regiment), are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Joseph Adams, M.B.

Surgeon-Lieutenant William Joseph Collins.

*5th Battalion the Prince of Wales' Volunteers (South Lancashire Regiment).*—Surgeon-Lieutenant Ralph Richardson Brunskill, M.D., from the 2nd Volunteer Battalion the Prince of Wales' (South Lancashire Regiment), to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th Battalion the Loyal North Lancashire Regiment.*—The undermentioned officers, from the 1st Volunteer Battalion the Loyal North Lancashire Regiment, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain John William Rigby.

Surgeon-Lieutenant Frederic Thomas Walmsley.

*5th Battalion the Manchester Regiment.*—The undermentioned officer, from the 1st Volunteer Battalion the Manchester Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel William M. Roocroft.

*6th Battalion the Manchester Regiment.*—The undermentioned officer, from the 2nd Volunteer Battalion the Manchester Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major George Henry Darwin, M.D.

*7th Battalion the Manchester Regiment.*—The undermentioned officer, from the 4th Volunteer Battalion the Manchester Regiment, is appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant John Crawhall Nichol, M.D.

*4th Battalion (Alexandra) Princess of Wales' Own (Yorkshire Regiment).*—The undermentioned officers, from the 1st Volunteer Battalion Alexandra, Princess of Wales' Own (Yorkshire Regiment), are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Harry Legh de Legh, M.D.

Surgeon-Lieutenant Clarence Barns Whitehead, M.B.

*2nd Battalion the Monmouthshire Regiment.*—The undermentioned officers, from the 3rd Volunteer Battalion the South Wales Borderers, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel James Rowlands Essex.

Surgeon-Lieutenant Edward Meredith Griffith.

*5th Battalion the Prince of Wales' (North Staffordshire Regiment).*—Surgeon-Lieutenant Lawrence Campbell Vigor Hardwicke, from the 1st Volunteer Battalion, the Prince of Wales' (North Staffordshire Regiment), to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*6th Battalion Cheshire Regiment.*—The undermentioned officers, from the 4th Volunteer Battalion the Cheshire Regiment, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Ralph Bennett Sidebottom.

Surgeon-Captain Eugene Charles McCarthy.

*4th (Denbighshire) Battalion the Royal Welsh Fusiliers.*—The undermentioned officers, from the 1st Volunteer Battalion the Royal Welsh Fusiliers, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Richard Drinkwater.

Surgeon-Lieutenant Jonas William Anderson, M.B.

*7th (Merioneth and Montgomery) Battalion the Royal Welsh Fusiliers.*—Surgeon-Lieutenant William Richard Williams, from the 5th Volunteer Battalion the South Wales Borderers to be Surgeon-Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

*4th Battalion the Welsh Regiment.*—The undermentioned officers, from the 1st (Pembrokeshire) Volunteer Battalion the Welsh Regiment, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Major Evan Evans, M.B.

Surgeon-Lieutenant William Reginald Eyton Williams.

*5th Battalion the Welsh Regiment.*—The undermentioned officers, from the 2nd Volunteer Battalion the Welsh Regiment, are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Captain Rees David Morgan.

Surgeon-Lieutenant Evan James Trevor Jones.

*4th Battalion the King's (Shropshire Light Infantry).*—The undermentioned officers, from the 1st Volunteer Battalion the King's (Shropshire Light Infantry), are appointed to the Battalion, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Frederick Knollys Pigott.

Surgeon-Lieutenant William Dyson (to be supernumerary).

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Charles Henry Gwynn, M.D., from the 2nd Volunteer Battalion the King's (Shropshire Light Infantry), to be Surgeon-Lieutenant-Colonel, with the honorary rank of Surgeon-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

## ROYAL ARMY MEDICAL CORPS.

Sir Frederick Treves, Bart, G.C.V.O., C.B., M.D., LL.D., F.R.C.S.Eng., late Honorary Colonel, Royal Army Medical Corps (Militia), is appointed to the honorary Colonelcy of the Royal Army Medical Corps in the Wessex Division, dated September 21, 1908.

*1st Home Counties Field Ambulance.*—Lieutenant James S. Warrack, M.D., to be Captain, dated May 19, 1908.

*2nd Scottish General Hospital.*—Honorary Lieutenant in the Army Auckland Campbell Geddes, M.D., formerly Captain, the Queen's Rifle Volunteer Brigade the Royal Scots (Lothian Regiment), to be Major, dated June 1, 1908.

The surname of George Lovell Gullaud, M.D., is as now described, and not as stated in the *London Gazette* of October 13 and 20, 1908.

*Sanitary Service.*—Major Arthur Newsholme, M.D., to be Lieutenant-Colonel, dated August 22, 1908.

Arthur Cyril Bird to be Lieutenant, dated August 12, 1908.

Surgeon-Lieutenant Charles Kessick Bowes, M.D., from the 1st Volunteer Battalion the Buffs (East Kent Regiment), to be Captain, dated April 1, 1908.

Surgeon-Captain Frederick Burroughs Jefferiss, from the 4th Volunteer Battalion the Queen's Own (Royal West Kent Regiment), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*Welsh Border Mounted Brigade Field Ambulance.*—Alexander George Hamilton (late Captain, 5th [Earl of Chester's] Battalion the Cheshire Regiment) to be Captain, dated April 1, 1908.

Surgeon-General George Joseph Hamilton Evatt, C.B., M.D., is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the Home Counties Territorial Division, dated April 27, 1908.

*3rd Highland Field Ambulance.*—Quartermaster and Honorary Captain John Dunn, from the 3rd (Dundee Highland) Volunteer Battalion the Black Watch (Royal Highlanders), to be Quartermaster, with the honorary rank of Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

*1st East Lancashire Field Ambulance.*—The undermentioned officers, from the Western Command, Manchester Companies, Royal Army Medical Corps (Volunteers), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain William Bridgett Pritchard.

Captain Joseph Farrall Wright.

Captain Herbert George Parker.

Captain Walter Reginald Norman Smithard, M.B.

Captain Charles Roberts.

Lieutenant Henry George Smeeth, M.D.

Lieutenant William Robert Douglas.

Quartermaster and Honorary Captain William Frank Dickinson.

Captain William B. Pritchard to be Major, dated April 1, 1908.

Captain Herbert G. Parker to be Major, dated April 1, 1908.

Lieutenant Henry G. Smeeth, M.D., to be Captain, dated July 4, 1908.

*2nd East Lancashire Field Ambulance, Royal Army Medical Corps.*—The undermentioned officers, from the Western Command, Manchester Companies, Royal Army Medical Corps (Volunteers), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain Fred Duke Woolley.
Captain George Ashton, M.D.
Captain Alfred Francis Thompson, M.B.
Lieutenant Henry Bentley.
Lieutenant Thomas Carnwath, M.B.
Quartermaster and Honorary Lieutenant Sidney Pritchard.

The undermentioned officers, from the North-East Lancashire Bearer Company, Royal Army Medical Corps (Volunteers), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Major Thomas Holt, M.B.
Lieutenant Alexander Callam.
Lieutenant William Fraser Munro, M.B.

*3rd East Lancashire Field Ambulance.*—Captain (Honorary Lieutenant in the Army) John William Smith, M.B., from the Western Command, Manchester Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

The undermentioned officers, from the Western Command, Manchester Companies, Royal Army Medical Corps (Volunteers), are appointed to the unit, with rank and precedence as in the Volunteer Force, dated April 1, 1908:—

Captain William Leonard Bentley.
Captain Robert William Beesley.
Captain William Riddell Matthews, M.B.
Captain Harry Washington Pritchard.
Captain Wilfred Moritz Steinthal.
Lieutenant Gordon William Fitzgerald.
Lieutenant Cecil William Hutt.
Quartermaster and Honorary Lieutenant Alfred Ernest Royse.
Captain William L. Bentley to be Major, dated April 1, 1908.
Captain William R. Matthews, M.B., to be Major, dated April 1, 1908.
Lieutenant Gordon W. Fitzgerald to be Captain, dated July 4, 1908.

*2nd West Lancashire Field Ambulance.*—Owen Herbert Williams, M.B., to be Lieutenant, dated June 23, 1908.

*1st Welsh Field Ambulance.*—John Buckner to be Lieutenant, dated April 1, 1908.

*2nd Scottish General Hospital.*—The surname of George Lovell Gullaud, M.D., is as now described, and not as stated in the *London Gazette* of October 13, 1908.

*1st Southern General Hospital.*—The undermentioned is appointed an officer whose services will be available on mobilisation:—

To be Captain: William Joseph McCardie, M.B., dated September 24, 1908.

*Sanitary Service.*—Surgeon-Lieutenant-Colonel John Arnault Jones, M.D., from the 2nd Volunteer Battalion the Welsh Regiment, to be Lieutenant-Colonel, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Major Nathaniel Edward Roberts, M.B., from the 2nd Volunteer Battalion the King's (Liverpool Regiment), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major Thomas Finlayson Dewar, M.B., from the Fifeshire and Forfarshire Imperial Yeomanry, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major Sydney Arthur Monckton Copeman, M.D., F.R.S., from the 2nd London Volunteer Rifle Corps, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major Archibald Kerr Chalmers, M.D., from the 1st Lanarkshire Royal Garrison Artillery (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain Francis Edward Freemantle, M.B., from the Herts Imperial Yeomanry, to be Major, dated April 1, 1908.

The undermentioned to be Majors:—

Arthur Newsholme, M.D., dated June 9, 1908.
James Robert Kaye, M.B., dated June 10, 1908.
Edward Serjeant, dated July 19, 1908.

John Robertson, M.D. (late Lieutenant, 2nd Volunteer Battalion the Prince of Wales' [Volunteers] South Lancashire Regiment), dated June 25, 1908.

The undermentioned officers, from the Imperial Yeomanry, are appointed to the Corps, in the ranks stated, with precedence as in the Imperial Yeomanry, dated April 1, 1908:—

Surgeon-Lieutenant-Colonel Russell Eliott Wood, from the Lanarkshire Imperial Yeomanry, to be Lieutenant-Colonel, dated April 1, 1908.

To be Majors: Surgeon-Major John Robinson Harper, from the Royal North Devon (Hussars) Imperial Yeomanry. Surgeon-Major Hugh Kelly, M.D., from the Lanarkshire (Queen's Own Royal Glasgow) Imperial Yeomanry.

To be Captains: Surgeon-Captain Charteris James Symonds, M.D., from the King's Colonials Imperial Yeomanry. Surgeon-Captain (Honorary Major in the Army) Charles Stonham, C.M.G., from the Middlesex (Duke of Cambridge's Hussars) Imperial Yeomanry. Surgeon-Captain Herbert William Whyte, from the 3rd County of London (Sharpshooters) Imperial Yeomanry. Surgeon-Captain Leonard Avery Avery, from the Suffolk (the Duke of York's Own Loyal Suffolk Hussars) Imperial Yeomanry. Surgeon-Captain John Henry Dauber, M.B., from the Sussex Imperial Yeomanry.

To be Lieutenants: Surgeon-Lieutenant Stanley Rider Gibbs, from the Royal North Devon (Hussars) Imperial Yeomanry. Surgeon-Lieutenant George Smith Ward, from the Herts Imperial Yeomanry. Surgeon-Lieutenant William Savile Henderson, M.D., from the King's Colonials Imperial Yeomanry. Surgeon-Lieutenant Robert Martin McQueen, from the City of London (Roughriders) Imperial Yeomanry. Surgeon-Lieutenant Herbert Meggitt, from the Middlesex (Duke of Cambridge's Hussars) Imperial Yeomanry. Surgeon-Lieutenant Frederic William Longhurst, from the 2nd County of London (Westminster Dragoons) Imperial Yeomanry. Surgeon-Lieutenant John McWatt, M.B., from the Lothians and Berwickshire Imperial Yeomanry.

The undermentioned officers, from the Volunteer Force, are appointed to the Corps in the ranks stated, with precedence as in the Volunteer Force, dated April 1, 1908:—

To be Lieutenant-Colonels: Surgeon-Lieutenant-Colonel James Thompson, M.D., from 1st Ayrshire and Galloway Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Colonel James William Thornton Gilbert, from the 1st Cinque Ports Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant-Colonel Robert Balfour Graham, F.R.C.S.Edin., from the 1st Fifeshire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant-Colonel Arthur Douglas Webster, M.D., from the Queen's Rifle Volunteer Brigade the Royal Scots (Lothian Regiment). Surgeon-Lieutenant-Colonel James Mill, M.B., from the 5th Volunteer Battalion the Royal Scots (Lothian Regiment). Surgeon-Lieutenant-Colonel Robert Kirk, M.D., from the 8th Volunteer Battalion the Royal Scots (Lothian Regiment). Surgeon-Lieutenant-Colonel John Maurice Harper, from the 1st Volunteer Battalion the Prince Albert's (Somersetshire Light Infantry). Surgeon-Lieutenant-Colonel William Wilson, M.D., from the 1st Volunteer Battalion the Royal Scots Fusiliers. Surgeon-Lieutenant-Colonel William Nettle, from the 2nd Volunteer Battalion the Duke of Cornwall's Light Infantry. Supernumerary Surgeon-Lieutenant-Colonel (Honorary Major in the Army) Edmond James Lawless, from the 4th Volunteer Battalion the East Surrey Regiment. Surgeon-Lieutenant-Colonel (Honorary Captain in the Army) Charles Edward Douglas, M.B., from the 6th Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Lieutenant-Colonel Philip Percival Whitcombe, M.B., from the 13th Middlesex (Queen's Westminster) Volunteer Rifle Corps. Surgeon-Lieutenant-Colonel Charles Graham Grant, from the 24th Middlesex Volunteer Rifle Corps.

To be Majors: Surgeon-Major John Bowine Berry, from the 1st Cinque Ports Royal Garrison Artillery (Volunteers). Surgeon-Major Richard John Bryden, from the 1st Kent Royal Garrison Artillery (Volunteers). Surgeon-Major John Frederick Tabb, from the 2nd Kent Royal Garrison Artillery (Volunteers). Surgeon-Major Alexander Barclay Lyon, M.D., from the 2nd Middlesex Royal Garrison Artillery (Volunteers). Surgeon-Major Thomas Edmund Stuart, from the 1st Suffolk and Harwich Royal Garrison Artillery (Volunteers). Surgeon-Major William Alfred Dingle, M.D., from the East London (Tower Hamlets) Royal Engineers (Volunteers). Surgeon-Major William Henry Bourke, M.D., from the 1st Middlesex Royal Engineers (Volunteers). Surgeon-Major James Aitken Clark, M.B., and Surgeon-Major John Hugh Alexander Laing, M.B., from the Queen's Rifle Volunteer Brigade, the Royal Scots (Lothian Regiment). Surgeon-Major Richard James Maitland Coffin, and Surgeon-Major Campbell Boyd, from the 3rd Volunteer Battalion the Queen's (Royal West Surrey Regiment). Surgeon-Major Joseph Dallas Pratt, M.D., and Surgeon-Major Henry Dutch, M.D., from the 4th Volunteer Battalion the Royal Fusiliers (City of London Regiment). Surgeon-Major Charles James Marsh, from the 2nd Volunteer Battalion the Prince Albert's (Somersetshire Light Infantry). Surgeon-Major Frederick Vasey Adams, from the 1st Lanarkshire Volunteer Rifle Corps. Surgeon-Major Thomas Forrest, M.B., from the 3rd Lanarkshire Volunteer Rifle Corps. Surgeon-Major Walter Alexander Atkinson, M.D., from the 1st Surrey (South London) Volunteer Rifle Corps. Surgeon-Major Josiah Telfer Thomas, and Surgeon-Major Casper Robert Laurie, from the 1st Volunteer Battalion the Duke of Cornwall's Light Infantry. Surgeon-Major Kenneth Walter Ingleby Mackenzie, from the 5th (Isle of Wight "Princess Beatrice's") Volunteer Battalion the Hampshire Regiment. Surgeon-Major

James Samuel Yeaman Rogers, M.B., from the 1st (City of Dundee) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Major Charles Nairne Lee, M.B., from the 6th Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Major Francis James Warwick, M.B., from the 3rd Volunteer Battalion the Essex Regiment. Surgeon-Major Charles Boyce, M.D., and Surgeon-Major Christopher Vise, M.D., from the 1st Volunteer Battalion the Queen's Own (Royal West Kent Regiment). Surgeon-Major Arthur David Ducat, M.B., from the 1st London Volunteer Rifle Corps. Surgeon-Major Joseph George Turner, from the 7th Middlesex (London Scottish) Volunteer Rifle Corps.

Surgeon-Captain Arthur Heygate Vernon, from the 4th Volunteer Battalion the Hampshire Regiment, to be Major, dated April 1, 1908.

To be Captains: Surgeon-Captain John Hector Stephen, from the 1st Banff Royal Garrison Artillery (Volunteers). Surgeon-Captain Herman Stedman, M.D., from the 1st City of London Royal Garrison Artillery (Volunteers). Surgeon-Captain Thomas Alfred Walker, from the 1st Dorsetshire Royal Garrison Artillery (Volunteers). Surgeon-Captain James Crawford Gibb Macnab, M.B., and Surgeon-Captain Alexander Edward Watson, M.B., from the 1st Fifeshire Royal Garrison Artillery (Volunteers). Surgeon-Captain Edmund Napier Close, and Surgeon-Captain Alexander Arthur MacKeith, M.B., from the 1st Hampshire Royal Garrison Artillery (Volunteers). Surgeon-Captain Thomas Kay, M B., and Surgeon-Captain Robert Wardrop Forrest, M.B., from the 1st Lanarkshire Royal Garrison Artillery (Volunteers). Surgeon-Captain Charles Gordon Watson, from the 3rd Middlesex Royal Garrison Artillery (Volunteers). Surgeon-Captain Ernest Tom Cox, M.D., from the 1st Sussex Royal Garrison Artillery (Volunteers). Surgeon-Captain Richard Emmett, from the 1st Hampshire Royal Engineers (Volunteers). Surgeon-Captain William Robertson Willis, and Surgeon-Captain Thomas Donald Laird, from the 2nd Lanarkshire Royal Engineers (Volunteers). Surgeon-Captain Frederick Swinford Edwards, from the East London (Tower Hamlets) Royal Engineers (Volunteers). Surgeon-Captain James Wilson, M.B., from the Forth Division (Electrical Engineers) Royal Engineers (Volunteers). Surgeon-Captain Cecil Huntingdon Leaf, M.B., from the London Division (Electrical Engineers) Royal Engineers (Volunteers). Surgeon-Captain James Scott, M.B., from the Queen's Rifle Volunteer Brigade the Royal Scots (Lothian Regiment). Surgeon-Captain George Melville, M.B., and Surgeon-Captain James Cameron, from the 6th Volunteer Battalion the Royal Scots (Lothian Regiment). Surgeon-Captain William Young, M.B., from the 8th Volunteer Battalion the Royal Scots (Lothian Regiment). Surgeon-Captain John Cummings, from the 9th Volunteer Battalion (Highlanders) the Royal Scots (Lothian Regiment). Surgeon-Captain Herbert Stedman Oliver, from the 1st Volunteer Battalion the Buffs (East Kent Regiment). Surgeon-Captain Peter Paget, and Surgeon-Captain Joshua Low Kerr, M D., from the 2nd (the Weald of Kent) Volunteer Battalion the Buffs (East Kent Regiment). Surgeon-Captain Richard Joselyn Swan, from the 1st Volunteer Battalion the Queen's (Royal West Surrey Regiment). Surgeon-Captain John Orton, from the 2nd Volunteer Battalion the Royal Warwickshire Regiment. Surgeon-Captain James Alexander Angus, from the 3rd Volunteer Battalion the Royal Fusiliers (City of London Regiment). Surgeon-Captain John Frederick Fitzgerald Parr, from the 4th Battalion the Royal Fusiliers (City of London Regiment). Surgeon-Captain Frederic Wellesley Kendle, from the 4th Volunteer Battalion the Devonshire Regiment. Surgeon-Captain Cecil Edward Stephens, M.D., from the 3rd (Cambridgeshire) Volunteer Battalion the Suffolk Regiment. Surgeon-Captain Henry Ashton Rudyard. Surgeon-Captain Thomas Beard, and Surgeon-Captain John Best McBride, from the 2nd (Hertfordshire) Volunteer Battalion the Bedfordshire Regiment. Surgeon-Captain (Honorary Lieutenant in the Army) James Craik Taylor, M.B., from the 1st Volunteer Battalion the Royal Scots Fusiliers. Surgeon-Captain William Roxburgh, M.B., from the 2nd Volunteer Battalion the Royal Scots Fusiliers. Surgeon-Captain William Turnbull Barrie, M.B., Surgeon-Captain William Doig, M.D., and Surgeon-Captain Robert William Meikle, from the 1st Roxburgh and Selkirk (the Border) Volunteer Rifle Corps. Surgeon-Captain David Robertson Dobie, M.D., and Surgeon-Captain John Young, M.B., from the 2nd (Berwickshire) Volunteer Battalion the King's Own Scottish Borderers. Surgeon-Captain George Robert Livingstone, M.B., from the 3rd (Dumfries) Volunteer Battalion the King's Own Scottish Borderers. Surgeon-Captain Robert Home Henderson, M.D., from the 1st Lanarkshire Volunteer Rifle Corps. Surgeon-Captain James Livingstone Loudon, M.B., and Surgeon-Captain John Marshall, M.B., from the 2nd Volunteer Battalion the Cameronians (Scottish Rifles), Surgeon-Captain Alexander Roxburgh, M.D., from the 3rd Lanarkshire Volunteer

Rifle Corps. Surgeon-Captain Martin Alfred Cooke, from the 2nd Volunteer Battalion the Gloucestershire Regiment. Surgeon-Captain Charles Robert Browne, M.D., from the 3rd Volunteer Battalion the Gloucester Regiment. Surgeon-Captain Cyril Aloysius Corke, from the 2nd Volunteer Battalion the Worcestershire Regiment. Surgeon-Captain Thomas Brushfield, M.B., from the 2nd Volunteer Battalion the East Surrey Regiment. Surgeon-Captain Charles James Martin, M.B., and Surgeon-Captain Thomas Mahon Morton, from the 4th Volunteer Battalion the East Surrey Regiment. Surgeon-Captain Daniel Oliver Kerr, M.B., from the 1st Surrey (South London) Volunteer Rifle Corps. Surgeon-Captain (Honorary Captain in the Army) George Black, M.B., and Surgeon-Captain John Elsdale Molson, M.B., from the 2nd Volunteer Battalion the Royal Sussex Regiment. Surgeon-Captain William Henry Harland, from the 5th (Isle of Wight, "Princess Beatrice's") Volunteer Battalion the Hampshire Regiment. Surgeon-Captain Edward Richard Williams, from the 1st (Pembrokeshire) Volunteer Battalion the Welsh Regiment. Surgeon-Captain George Francis Whyte, M.B., from the 1st (City of Dundee) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Captain John Sutherland Mackay, M.D., and Surgeon-Captain Robert Thomson Ferguson, M.D., from the 6th Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Captain Hugh Neville Adam Taylor, M.D., from the 3rd Volunteer Battalion the Essex Regiment. Surgeon-Captain Harry Thornton Challis, from the 4th Volunteer Battalion the Essex Regiment. Surgeon-Captain John Allison, M.D., from the 1st Volunteer Battalion the Northamptonshire Regiment. Surgeon-Captain George Robert Fabris Stillwell, M.B., from the 2nd Volunteers Battalion the Queen's Own (Royal West Kent Regiment). Surgeon-Captain Frederick Harcourt Gervis, from the 17th Middlesex (North Middlesex) Volunteer Rifle Corps. Surgeon-Captain Frederick Richard Miller, from the 4th Middlesex (Kensington) Volunteer Rifle Corps. Surgeon-Captain Charles Arthur Goullet, from the 5th Middlesex (West Middlesex) Volunteer Rifle Corps. Surgeon-Captain Charles Arthur Morris, C.V.O., M.B., from the 13th Middlesex (Queen's Westminster) Volunteer Rifle Corps. Surgeon-Captain William Aberdein Malcolm, M.B., and Surgeon-Captain Charles Allen Casterton Smelt, M.B., from the 21st Middlesex (the Finsbury) Volunteer Rifle Corps. Surgeon-Captain Albert Ehrmann, from the 22nd Middlesex (Central London Rangers) Volunteer Rifle Corps. Surgeon-Captain Henry Kay Ramsden, from the 2nd London Volunteer Rifle Corps. Surgeon-Captain John Orr, M.B., from the 1st Volunteer Battalion the Manchester Regiment. Surgeon-Captain James Allan Wilson, M.D., and Surgeon-Captain Peter Mackellar Dewar, from the 3rd (the Blythswood) Volunteer Battalion the Highland Light Infantry. Surgeon-Captain John Bradford. Surgeon-Captain Thomas Wilson Banks, M.B., and Surgeon-Captain William Jones Mackinnon, M.B., from the 9th Lanarkshire Volunteer Rifle Corps. Surgeon-Captain William Ritchie, M.B., and Surgeon-Captain Thomas Douglas Brown, M.B., from the 5th (Glasgow Highland) Volunteer Battalion the Highland Light Infantry. Surgeon-Captain George Clark Cathcart, M.B., and Surgeon-Captain Alexander Howard Pirie, M.B., from the 7th Middlesex (London Scottish) Volunteer Rifle Corps. Surgeon-Captain Edmond Ultain Frederick MacWilliam Bourke, from the 18th Middlesex Volunteer Rifle Corps. Surgeon-Captain William Francis Roe, and Supernumerary Surgeon-Captain William George Macfee, from the 19th Middlesex (St. Giles's and St. George's, Bloomsbury) Volunteer Rifle Corps. Surgeon-Captain James Steel Swain, from the 2nd Tower Hamlets Volunteer Rifle Corps.

To be Lieutenants: Surgeon-Lieutenant John Aitken, M.D., from the 1st Ayrshire and Galloway Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant William Manson Fergusson, from the 1st Banff Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant William Greenwood Sutcliffe, from 1st Cinque Ports Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Paul Joseph O'Sullivan, from the 1st City of London Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Hugh Richardson, M.D., from the 1st Fifeshire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant York Thomas Gray Moore, from the 2nd Kent Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Thomas Jefferson Faulder, from the 3rd Middlesex Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Thomas Sanders Worboys, from the 1st Sussex Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Samuel Martyn, M.B., and Surgeon-Lieutenant James Andrew, M.B., from the 2nd Lanarkshire Royal Engineers (Volunteers). Surgeon-Lieutenant Edward Canny Ryall, F.R.C.S.(I.), from the East London (Tower Hamlets) Royal Engineers (Volunteers). Surgeon-Lieutenant John Hobbs, from the 1st London Royal Engineers (Volunteers). Surgeon-Lieutenant Antony Alexander Martin, M.D., from the 1st Sussex Royal

Engineers (Volunteers). Surgeon-Lieutenant Neish Park Watt, M.B., from the Forth Division (Electrical Engineers) Royal Engineers (Volunteers). Surgeon-Lieutenant John Boyd Jamieson, from the Queen's Rifle Volunteer Brigade the Royal Scots (Lothian Regiment). Surgeon-Lieutenant William Lewis Martin, M.B., and Surgeon-Lieutenant David George Davidson, from the 4th Volunteer Battalion the Royal Scots (Lothian Regiment). Surgeon-Lieutenant John Frank Crombie, from the 7th Volunteer Battalion, the Royal Scots (Lothian Regiment). Surgeon-Lieutenant Robert Cross, from the 8th Volunteer Battalion the Royal Scots (Lothian Regiment). Surgeon-Lieutenant John Macaulay Bowie, M.D., from the 9th Volunteer Battalion (Highlanders) the Royal Scots (Lothian Regiment). Surgeon-Lieutenant Walter Gray Paget, from the 1st Volunteer Battalion the Queen's (Royal West Surrey Regiment). Surgeon-Lieutenant Charles James Izzard Krumbholz, M.B., from the 2nd Volunteer Battalion the Royal Warwickshire Regiment. Surgeon-Lieutenant Reginald Ironside, from the 2nd Volunteer Battalion the Royal Fusiliers (City of London Regiment). Surgeon-Lieutenant Walter Fitzpatrick, from the 5th (the Hay Tor) Volunteer Battalion the Devonshire Regiment. Surgeon-Lieutenant Herbert Mayris Sylvester, from the 1st Volunteer Battalion the Suffolk Regiment. Surgeon-Lieutenant William James Caie, from the 2nd Volunteer Battalion the Suffolk Regiment. Surgeon-Lieutenant Arthur Norman Haig, M.B., from the 2nd Volunteer Battalion the Prince Albert's (Somersetshire Light Infantry). Surgeon-Lieutenant Eric Dalrymple Gairdner, from the 2nd Volunteer Battalion the Royal Scots Fusiliers. Surgeon-Lieutenant George McKellar, M.D., from the 1st Roxburgh and Selkirk (the Border) Volunteer Rifle Corps. Surgeon-Lieutenant David Robert Taylor, from the 2nd (Berwickshire) Volunteer Battalion the King's Own Scottish Borderers. Surgeon-Lieutenant John Lawson Rankine, from the 3rd (Dumfries) Volunteer Battalion the King's Own Scottish Borderers. Surgeon-Lieutenant Arthur Innes, from the 1st Lanarkshire Volunteer Rifle Corps. Surgeon-Lieutenant John Paton, M.D., from the 3rd Lanarkshire Volunteer Rifle Corps. Surgeon-Lieutenant Alexander Bankier Sloan, M.D., from the 4th Volunteer Battalion the Cameronians (Scottish Rifles). Surgeon-Lieutenant Prosper James Liston, from the 1st Volunteer Battalion the Duke of Cornwall's Light Infantry. Surgeon-Lieutenant Richard William Brimacombe, from the 3rd Volunteer Battalion the East Surrey Regiment. Surgeon-Lieutenant Robert James William Oswald, from the 1st Surrey (South London) Volunteer Rifle Corps. Surgeon-Lieutenant James Albert Gibson, M.B., from the 5th (Isle of Wight, Princess Beatrice's) Volunteer Battalion the Hampshire Regiment. Surgeon-Lieutenant Archibald Richard Paterson, M.B., from the 1st Volunteer Battalion the Dorsetshire Regiment. Surgeon-Lieutenant David Arthur Hughes, from the 1st (Pembrokeshire) Volunteer Battalion the Welsh Regiment. Surgeon-Lieutenant Robert Thornton, M.B., from the 1st Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Lieutenant John Hunter Park Paton, from the 6th Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Lieutenant George Herbert Lewis, from the 1st Volunteer Battalion the Northamptonshire Regiment. Surgeon-Lieutenant Charles Humphrey Sedgwick, from the 1st Volunteer Battalion the Northamptonshire Regiment. Surgeon-Lieutenant John Edward Simpson, M.B., and Surgeon-Lieutenant Henry Lonsdale Gregory, M.B., from the 1st Volunteer Battalion the Duke of Cambridge's Own (Middlesex Regiment). Surgeon-Lieutenant William Lloyd, from the 22nd Middlesex (Central London Rangers) Volunteer Rifle Corps. Surgeon-Lieutenant David Westwood, M.B., and Surgeon-Lieutenant George Tubb, M.D., from the 2nd Volunteer Battalion the Highland Light Infantry. Surgeon-Lieutenant Robert Paterson, from the 9th Lanarkshire Volunteer Rifle Corps. Surgeon-Lieutenant Alexander McPhail, from the 5th (Glasgow Highland) Volunteer Battalion the Highland Light Infantry. Surgeon-Lieutenant John Allan, M.B., and Surgeon-Lieutenant James Patterson Wilson, M.B , from the 1st (Dumbartonshire) Volunteer Rifle Corps. Surgeon-Lieutenant John William Thomson Walker, M.B., from the 7th Middlesex (London Scottish) Volunteer Rifle Corps. Surgeon-Lieutenant William Cameron Macaulay, M.B., from the 15th Middlesex (the Customs' and Docks') Volunteer Rifle Corps. Surgeon-Lieutenant Charles Augustus Spooner, from the 16th Middlesex (London Irish) Volunteer Rifle Corps.

John James Weaver to be Lieutenant, dated May 1, 1908. Richard Cadwaladr Roberts to be Lieutenant, dated July 1, 1908. Captain Cecil Edward Stephens, M.D., to be Major, dated August 12, 1908. William Thomas Harkness to be Lieutenant, dated August 21, 1908. Arthur Lewis Heiser to be Lieutenant, dated September 4, 1908. Leonard Buckell Cane to be Lieutenant, dated September 15, 1908.

### ROYAL ARMY MEDICAL CORPS.

Charles John Bond, F.R.C.S.Eng., is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the North Midland Territorial Division, dated September 21, 1908.

Howard Marsh, F.R.C.S.Eng., is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the East Anglian Territorial Division, dated October 1, 1908.

Sir George Hare Philipson, Kt., M.D., is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the Northumberland Territorial Division, dated October 1, 1908.

*3rd Highland Field Ambulance.*—Arthur Melville Davie to be Lieutenant, dated May 2, 1908.

*2nd East Lancashire Field Ambulance.*—Major John James Kent Fairclough, M.D., from the Western Command, Manchester Companies, Royal Army Medical Corps (Volunteers), to be Lieutenant-Colonel, dated April 1, 1908.

Captain Fred D. Woolley to be Major, dated April 1, 1908.

*1st West Lancashire Field Ambulance.*—William Macdonald, M.B., to be Lieutenant, dated April 1, 1908.

John Edward Whitley MacFall, M.B., to be Lieutenant, dated April 1, 1908.

Richard Stopford Taylor, M.B., to be Lieutenant, dated April 1, 1908.

Cecil Lennox Williamson to be Lieutenant, dated April 1, 1908.

Charles Gamble Bishop to be Transport Officer, with the honorary rank of Lieutenant, dated April 2, 1908.

*2nd West Lancashire Field Ambulance.*—Frederick William Kerr Tough, F.R.C.S. Edin., to be Lieutenant, dated April 1, 1908.

Alfred Harold Godwin to be Lieutenant, dated April 1, 1908.

Charles Stuart Brebner, M.D., to be Lieutenant, dated April 1, 1908.

Adam Pearson Hope Simpson to be Lieutenant, dated April 1, 1908.

*3rd West Lancashire Field Ambulance.*—Anson Warren Merrick, F.R.C.S.I., to be Lieutenant, dated April 1, 1908.

Ernest Knight, M.B., to be Lieutenant, dated April 1, 1908.

Norman Stuart Jeffrey, M.B., to be Lieutenant, dated April 1, 1908.

*1st North Midland Field Ambulance.*—Arthur George Kewley to be Lieutenant, dated September 26, 1908.

*For Attachment to Units other than Medical Units.*—Winstan St. Audrew St. John to be Lieutenant, dated April 1, 1908.

Horace Carlos Barr to be Lieutenant, dated September 1, 1908.

Surgeon-Lieutenant-Colonel Bruce Goff, M.D., Retired List (Volunteers), from the Honorary Colonelcy of the Scottish Command, Glasgow Companies, Royal Army Medical Corps (Volunteers), is appointed to the Honorary Colonelcy of the Royal Army Medical Corps in the Lowland Territorial Division, with precedence as in the Volunteer Force, dated April 1, 1908.

*1st North Midland Field Ambulance.*—James Davison Allen, M.B., to be Lieutenant, dated October 4, 1908.

*3rd Welsh Field Ambulance.*—Surgeon-Captain David Llewellyn Davies, M.B., from the 2nd Volunteer Battalion the Welsh Regiment, to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Lieutenant William Alfred Thomas Lloyd, from the 1st (Pembrokeshire) Volunteer Battalion the Welsh Regiment, to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Lieutenant David Brynmor Chiles-Evans, from the Gloucester and Somerset Bearer Company, Royal Army Medical Corps (Volunteers), to be Lieutenant, with precedence as in the Volunteer Force, dated April 1, 1908.

Daniel Edward Evans to be Lieutenant, dated June 25, 1908.

Ernest Brice to be Lieutenant, dated June 25, 1908.

George David Edwardes Jones to be Lieutenant, dated July 7, 1908.

Joseph Cresswell Higman is appointed to Quartermaster, with the honorary rank of Lieutenant, dated July 7, 1908.

*For Attachments to Units other than Medical Units.*—The undermentioned officers, from the Volunteer Force, are appointed to the Corps in the rank specified, with precedence as in the Volunteer Force, dated April 1, 1908:—

To be Lieutenant-Colonels: Surgeon-Lieutenant-Colonel Thomas Horrocks Openshaw, C.M.G., M.B., F.R.C.S.Eng., from the Lincolnshire Imperial Yeomanry. Surgeon-Lieutenant-Colonel Murdo Macdonald, and Surgeon-Lieutenant-Colonel John

Munro Moir, M.D., from the Highland Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant-Colonel Edward Bass Rickett, M.D., from the 1st Lincolnshire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant-Colonel William Robert Sewell, M.D., from the 1st Renfrew and Dumbarton Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Colonel William Mearns, M.D., from the 1st Durham Royal Engineers (Volunteers). Surgeon-Lieutenant-Colonel Charles Cormack Greig, and Surgeon-Lieutenant-Colonel Walter Smith Cheyne, M.D., from the 2nd Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant-Colonel Robert Morrison Wilson, M.B., from the 3rd (the Buchan) Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant-Colonel Alexander Nicol, M.D., from the 4th (Donside Highland) Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant-Colonel George Cran, M.D. from the 5th (Deeside Highland) Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant-Colonel Alexander Duncan Fraser, M.D., from the 4th (Stirlingshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon-Lieutenant-Colonel Duncan William Currie, M.B., from the 7th (Clackmannan and Kinross) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders).

To be Majors: Surgeon-Major David Durran, M.B., from the 1st Caithness Royal Garrison Artillery (Volunteers). Surgeon-Major David Todd, from the 2nd Durham (Seaham) Royal Garrison Artillery (Volunteers). Surgeon-Major David Middleton Greig, M.B., from the 1st Forfarshire Royal Garrison Artillery (Volunteers). Surgeon-Major James Duncan Farquharson, M.B., from the 1st Newcastle-on-Tyne Royal Garrison Artillery (Volunteers). Surgeon-Major (Honorary Captain in the Army) Alexander Butler, M.B., from the 1st Renfrew and Dumbarton Royal Garrison Artillery (Volunteers). Surgeon-Major Hugh Ransom Bramwell, M.B., from the Tynemouth Royal Garrison Artillery (Volunteers). Surgeon-Major William Sinclair, M.B., from the 1st Aberdeenshire Royal Engineers (Volunteers). Surgeon-Major William Henry Brown, from the Tyne Division (Electrical Engineers) Royal Engineers (Volunteers). Surgeon-Major William Crump Beatley, M.D., from the 3rd Volunteer Battalion the Northumberland Fusiliers Surgeon-Major Samuel Lodge, M.D., from the 2nd Volunteer Battalion the Prince of Wales's Own (West Yorkshire Regiment). Surgeon-Major James Harvey, from the 2nd Volunteer Battalion Alexandra, Princess of Wales's Own (Yorkshire Regiment). Surgeon-Major William Mabson Gabriel, from the 3rd Volunteer Battalion the Duke of Wellington's (West Riding Regiment). Surgeon-Major James Scott Wilson, M.D., from the 2nd Volunteer Battalion the South Staffordshire Regiment. Surgeon-Major Robert Stirling, M D., from the 4th (Perthshire) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Major Robert Ebenezer Beveridge, M.B., from the 3rd (Sunderland) Volunteer Battalion the Durham Light Infantry. Surgeon-Major Andrew Paige Arnold, M.D., from the 5th Volunteer Battalion the Durham Light Infantry. Surgeon-Major George Williamson, M.B., from the 1st Volunteer Battalion the Gordon Highlanders. Surgeon-Major John Osbert Wilson, M.D., from the 4th (Donside Highland) Volunteer Battalion the Gordon Highlanders. Surgeon-Major James Taylor, M.D., from the 6th Volunteer Battalion the Gordon Highlanders. Surgeon-Major Alexander Leitch, M.B., from the 1st (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon-Major Hugh Colligan Donald, M.B., from the 2nd (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon-Major Duncan McMillan, M.B., and Surgeon-Major John Ritchie, M.B., from the 5th Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon-Major David Robert Oswald, M.B., from the 7th (Clackmannan and Kinross) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders).

Captain Alexander C. Miller, M.D., to be Major, dated May 15, 1908.

To be Captains: Surgeon-Captain William Tweed Hannah, M.D., from the Derbyshire Yeomanry. Surgeon-Captain James Anderson Taylor, M.B., and Surgeon-Captain David Mitchell Macdonald, M.B., from the Scottish Horse Imperial Yeomanry. Surgeon-Captain David Johnston Penney, M.B., and Surgeon-Captain Thomas Harvey Thompson, M.D., from the 1st Argyll and Bute Royal Garrison Artillery (Volunteers). Surgeon-Captain William Gray, M.D., from the 4th Durham Royal Garrison Artillery (Volunteers). Surgeon-Captain William Atkinson Taylor, M.B., and Surgeon Captain Horace Crakenthorp Colman, M.D., from the 1st Forfarshire Royal Garrison Artillery (Volunteers). Surgeon-Captain George Wilson, M.B., from the Highland Royal Garrison Artillery (Volunteers). Surgeon-Captain Lewis Walter Pockett, from the 1st Lincolnshire Royal Garrison Artillery (Volunteers). Surgeon-Captain John Cromie, from the Tynemouth Royal Garrison Artillery (Volunteers). Surgeon-Captain Hugh

Dickie, M.B., from the 1st Volunteer Battalion the Northumberland Fusiliers. Surgeon-Captain Louis Petro Demetriadi, M.D., and Surgeon-Captain Henry William Williams, M.D., from the 2nd Volunteer Battalion the Duke of Wellington's (West Riding Regiment). Surgeon-Captain David Walker, from the 3rd Volunteer Battalion the Duke of Wellington's (West Riding Regiment). Surgeon-Captain William Edward Foggie, M.B., from the 3rd (Dundee) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Captain William Haig, M.B., from the 4th (Perthshire) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Captain Edward Ley Paton, M.B., from the 5th (Perthshire Highland) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Captain Edgar Harold Brunt, from the 1st Volunteer Battalion the Prince of Wales's (North Staffordshire Regiment). Surgeon-Captain William Byron Milbanke, M.B., from the 3rd (Sunderland) Volunteer Battalion the Durham Light Infantry. Surgeon-Captain Selby Wetherell Plummer, M.B., from the 4th Volunteer Battalion the Durham Light Infantry. Surgeon-Captain John Cameron, M.B., and Surgeon-Captain Richard Brodie, from the 1st (Ross Highland) Volunteer Battalion Seaforth Highlanders (Ross-shire Buffs, the Duke of Albany's). Surgeon-Captain Donald Graham Campbell, from the 3rd (Morayshire) Volunteer Battalion Seaforth Highlanders (Ross-shire Buffs, the Duke of Albany's). Surgeon-Captain John Farquhar Christie, M.B., from the 1st Volunteer Battalion the Gordon Highlanders. Surgeon-Captain Andrew Fowler, M.D., from the 2nd Volunteer Battalion the Gordon Highlanders. Surgeon-Captain James Middleton, M.B., from the 3rd (the Buchan) Volunteer Battalion the Gordon Highlanders. Surgeon-Captain Robert Rannie, M.B., and Surgeon Captain William Gordon Mitchell, M.D., from the 5th (Deeside Highland) Volunteer Battalion the Gordon Highlanders. Surgeon-Captain Thomas Alexander Sellar, M.B., from the 6th Volunteer Battalion the Gordon Highlanders. Surgeon Captain John Fordyce Robertson, M.D., from the 7th Volunteer Battalion the Gordon Highlanders. Surgeon-Captain Alexander Cameron Miller, M.D., from the 1st (Inverness-shire Highland) Volunteer Battalion the Queen's Own Cameron Highlanders. Surgeon-Captain John Barr Stevens, M.B., and Surgeon-Captain James Cowe Herbertson, from the 2nd (Renfrewshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon Captain John Gilfillan Ronald, M.B., from the 4th (Stirlingshire) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon-Captain James Pearson Brown, M.B., from the 5th Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders). Surgeon-Captain Edmund Eustace Dyer, M.B., from the 7th (Clackmannan and Kinross) Volunteer Battalion Princess Louise's (Argyll and Sutherland Highlanders).

To be Lieutenants: Surgeon-Lieutenant James Graham Miller, M.B., from the 4th Battalion Northumberland Fusiliers. Surgeon-Lieutenant Alan Leonard Smith Tuke, M.B., from the Fifeshire and Forfarshire Imperial Yeomanry. Surgeon-Lieutenant John Leach, M.B., and Surgeon-Lieutenant Alexander George Lovett-Campbell, M.B., from Lovat's Scouts Imperial Yeomanry. Surgeon-Lieutenant Andrew Currie, M.B., and Surgeon-Lieutenant John Stewart, from the 1st Argyll and Bute Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Alan Ayre-Smith, Surgeon-Lieutenant William George Thompson, M.D., and Surgeon-Lieutenant Frank Wilfred Burn, M.B., from the 1st Durham Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Alfred Augustus Beeks, from the 2nd Durham (Seaham) Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Lloyd Turton Price, M.B., from the 1st Forfarshire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant William Jenner Best, from the 1st Lincolnshire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Wilfred Ernest Alderson, M.D., from the 1st Newcastle-on-Tyne Royal Engineers (Volunteers). Surgeon-Lieutenant Alfred Lees Low, from the 1st Orkney Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Francis William Squair, M.B., from the 1st Renfrew and Dumbarton Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant William Edwyn Falkingbridge Tinley, M.D., from the 1st East Riding of Yorkshire Royal Garrison Artillery (Volunteers). Surgeon-Lieutenant Frederick Philip, M.B., from the Aberdeenshire Royal Engineers (Volunteers). Surgeon-Lieutenant David Henderson Weir, M.D., from the 1st Durham Royal Engineers (Volunteers). Surgeon-Lieutenant Henry Smurthwaite, M.D., from the 3rd Volunteer Battalion the Northumberland Fusiliers. Surgeon-Lieutenant Henry Stanley Walker, M.D., from the 3rd Volunteer Battalion the Lincolnshire Regiment. Surgeon-Lieutenant Robert Hugh Gilbert-Bruce, from the 2nd (Angus) Volunteer Battalion the Black Watch (Royal Highlanders). Surgeon-Lieutenant Edward Fox MacLeod Neave, M.D., from the 3rd (Dundee Highland) Volunteer Battalion the Black Watch (Royal Highlanders).

Surgeon-Lieutenant William Duncan, M.B., from the 2nd Volunteer Battalion the Sherwood Foresters (Nottinghamshire and Derbyshire Regiment). Surgeon-Lieutenant Alexander Charles Farquharson, M.D., from the 2nd Volunteer Battalion the Durham Light Infantry. Surgeon-Lieutenant Frederick Keiller Smith, from the 1st Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant William Cockburn, M.B., from the 2nd Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant James Nicol, M.B., and Surgeon-Lieutenant Edward Oliphant, M.B., from the 4th (Donside Highland) Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant Alexander Cruickshank. M.B., from the 5th (Deeside Highland) Volunteer Battalion the Gordon Highlanders. Surgeon-Lieutenant Andrew Brown Murray, from the 6th Volunteer Battalion the Gordon Highlanders.

Lieutenant William L. Martin, M.B., to be Captain, dated April 6, 1908.

Hugh Kirbell Lacey to be Lieutenant, dated April 10, 1908.

James Law Brownridge to be Lieutenant, dated May 4, 1908.

William Arthur Valentine to be Lieutenant, dated May 14, 1908.

Lieutenant James B. Jamieson to be Captain, dated May 19, 1908.

Frederick Ernest Stokes to be Lieutenant, dated May 19, 1908.

### ROYAL ARMY MEDICAL CORPS.

Alexander Ogston, M.D., LL.D., is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the Highland Territorial Division, dated April 1, 1908.

Richard Caton, M.D., is appointed to the Honorary Colonelcy of the Royal Army Medical Corps of the West Lancashire Territorial Division, dated April 1, 1908, for attachment to Units.

Surgeon-Lieutenant-Colonel Frederick Henry Appleby, from the 4th (Nottinghamshire) Volunteer Battalion the Sherwood Foresters (Nottinghamshire and Derbyshire Regiment), to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Major Walter Moffett Hamilton, M.D., from the 3rd Volunteer Battalion the Lancashire Fusiliers, to be Major, with precedence as in the Volunteer Force, dated April 1, 1908.

Surgeon-Captain William Hearfield Galloway, from the 2nd (Leeds) Yorkshire (West Riding) Royal Engineers (Volunteers), to be Captain, with precedence as in the Volunteer Force, dated April 1, 1908.

Captain William Young, M.B., to be Major, dated September 25, 1908.

Lieutenant Robert Cross to be Captain, dated September 25, 1908.

Surgeon-Lieutenant John Alexander Nixon, from the 4th Battalion the Gloucestershire Regiment, to be Lieutenant, dated April 1, 1908.

*3rd Highland Field Ambulance.*—The appointment to a Lieutenancy of Sidney Watson Smith, M.B., bears date August 1, 1908, and not April 1, 1908, as stated in the *London Gazette*, of August 11, 1908.

*1st East Lancashire Field Ambulance.*—Captain Joseph F. Wright resigns his commission, dated August 29, 1908.

*3rd East Lancashire Field Ambulance.*—Captain Robert W. Beesley resigns his commission, dated August 20, 1908.

*5th London Field Ambulance.*—Lieutenant William Cameron Macaulay, M.B., from the Royal Army Medical Corps Territorial Force, to be Lieutenant, dated October 7, 1908.

*3rd Welsh Field Ambulance.*—Surgeon-Major Arthur Lloyd Jones, from the 6th (Glamorgan) Battalion Welch Regiment, to be Lieutenant-Colonel, dated April 1, 1908.

Surgeon-Captain George Arbour Stephens, M.D., from the 6th (Glamorgan) Battalion Welch Regiment, to be Captain, dated April 1, 1908.

Surgeon-Lieutenant Charles Leonard Isaac, from the 6th (Glamorgan) Battalion Welch Regiment, to be Lieutenant, dated April 1, 1908,

## VOLUNTEER CORPS.

### ROYAL GARRISON ARTILLERY (VOLUNTEERS).

*1st Ayrshire and Galloway.*—Surgeon-Lieutenant-Colonel Robert Allan, M.B., is granted the honorary rank of Surgeon-Colonel, dated March 30, 1908.

Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Robert Allan, M.B., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*1st Gloucestershire (Gloucester and Somerset).*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel John S. Carleton resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*3rd Kent (Royal Arsenal).*—Surgeon-Lieutenant-Colonel and Honorary Surgeon-Colonel Arthur H. Robinson, M.D., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*1st Cinque Ports.*—The undermentioned officers resign their commissions, dated March 31, 1908.

Surgeon-Lieutenant Edward C. McM. Murphy.

Surgeon-Lieutenant John R. Long.

*1st Cornwall (Duke of Cornwall's).*—Surgeon-Captain Charles C. Bullmore resigns his commission, dated March 31, 1908.

*1st Norfolk.*—Surgeon-Captain William O. Beddard resigns his commission, dated March 31, 1908.

## ROYAL ENGINEERS (VOLUNTEERS).

*1st Lanarkshire.*—Surgeon-Captain John H. Teacher, M.B., resigns his commission, dated March 31, 1908.

*1st Sussex.*—Surgeon-Captain Robert M. Johnston, M.B., resigns his commission, dated March 31, 1908.

Surgeon-Lieutenant Frederick R. Baker resigns his commission, dated March 31, 1908.

## RIFLE.

*6th Volunteer Battalion the Royal Scots (Lothian Regiment).*—Surgeon-Lieutenant Harold S. Ballantyne, M.B., resigns his commission, dated March 31, 1908.

*4th Volunteer Battalion the Queen's (Royal West Surrey Regiment).*—Surgeon-Lieutenant Charles S. Palmer resigns his commission, dated March 31, 1908.

*2nd Volunteer Battalion the Royal Scots Fusiliers.*—Honorary Assistant-Surgeon David Sloan resigns his commission, dated March 31, 1908.

*2nd (Berwickshire) Volunteer Battalion the King's Own Scottish Borderers.*—Surgeon-Major Samuel Macvie, M.B., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

The undermentioned officers resign their commissions, dated March 31, 1908:—

Surgeon-Lieutenant Alexander J. Campbell, M.B.

Surgeon-Lieutenant John Paxton.

*5th (Deeside Highland) Volunteer Battalion the Gordon Highlanders.*—The undermentioned Honorary Assistant-Surgeons are retired under the conditions of para. 103 Volunteer Regulations, dated March 31, 1908:—

James McHardy, M.D.

Alexander D. Keith, M.B.

*2nd Volunteer Battalion the Duke of Cornwall's Light Infantry.*—Surgeon-Captain Robert T. Meadows, M.D., to be Surgeon-Major, dated March 30, 1908.

Surgeon-Major Robert T. Meadows, M.D., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*2nd Volunteer Battalion the Queen's Own (Royal West Kent Regiment).*—Surgeon-Captain Richard A. Fegan resigns his commission, dated March 31, 1908.

*5th Volunteer Battalion the Cheshire Regiment.*—Surgeon-Captain Edward John Walter Carruthers, M.D., resigns his commission, dated March, 31, 1908.

*1st Volunteer Battalion the Royal Sussex Regiment.*—The undermentioned officers resign their commissions, dated March 31, 1908:—

Surgeon-Captain Ernest R. Hunt.

Surgeon-Lieutenant Alfred H. Copeman.

*5th (Glasgow Highland) Volunteer Battalion the Highland Light Infantry.*—Surgeon-Lieutenant-Colonel George Bell Todd, M.B., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated March 31, 1908.

*14th Middlesex (Inns of Court) Volunteer Rifle Corps.*—Surgeon-Captain Arthur M. Ware, M.D., resigns his commission, dated March 31, 1908.

## ROYAL ARMY MEDICAL CORPS.

*Western Command, Manchester Companies.*—Quartermaster Harold Thomson resigns his commission, dated March 31, 1908.

*London District, London Companies.*—Quartermaster and Honorary Lieutenant Henry C. Jones resigns his commission, dated March 31, 1908.

## QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE.

The following ladies have received appointments as Staff Nurse: Miss S. F. Davies, Miss I. M. L. du Sautoy, Miss W. M. Gedye, Miss E. D. Lang, Miss M. A. Roe, Miss H. C. Johnston.

*Postings and Transfers.*—Matrons: Miss E. Ferguson, to Netley, from Colchester; Miss L. W. Tulloh, R.R.C., to Devonport, from Dublin; Miss A. B. Smith, R.R.C., to South Africa, from Netley. Sisters: Miss E. C. Stewart, to South Africa, from Cambridge Hospital, Aldershot: Miss B. F. Perkins, to Cambridge Hospital, Aldershot, from Millbank, London; Miss A. L. Walker, to Netley, from Curragh; Miss J. E. Dods, to Curragh, from Netley; Miss E. J. Minns, to Curragh, from Connaught Hospital, Aldershot; Miss M. Clements, to Connaught Hospital, Aldershot, from Curragh. Staff Nurses: Miss M. Kearney, to Millbank, London, on appointment; Miss E. D. Lang, to Millbank, London, on appointment; Miss S. F. Davies, to Chatham, on appointment; Miss S. W. Wooler, to Colchester, from Chatham: Miss M. Ironside, to Cork, from Colchester; Miss M. A. G. Martin, to Millbank, London, from Curragh: Miss L. A. Burgess, to Connaught Hospital, Aldershot, from Millbank, London; Miss K. F. G. Skinner, to Curragh, from Connaught Hospital, Aldershot; Miss F. C. Craig, to Woolwich, from Curragh; Miss M. Tedman, to Curragh, from Woolwich; Miss M. E. Smith, to Woolwich, from York; Miss S. G. M. Rogers, to York, from Woolwich.

*Appointments confirmed.*—Miss K. A. Broade, Miss G. H. Caulfeild, Miss H. M. B. Carter, Miss E. S. M. Forrester, Miss C. Skinner, Miss H. V. B. Wolseley, Miss K. H. M. Holmes, Miss K. M. Mathews, Miss M. A. McCabe, Miss G. H. C. Paynter, Miss C. R. Townend, Miss F. McClelland, Miss C. Webster.

*Arrival.*—Miss M. MacGregor, Sister, from Egypt.

# EXAMINATIONS.

### Results of Examinations of Majors and Lieutenants, R.A.M.C.

The following results of examinations are notified for general information:—

Passed in (*h*) i. for rank of Captain: M. J. Cromie, E. G. Anthonisz, A. E. S. Irvine, E. W. M. Paine.

# UNIVERSITY OF LONDON.

### University Intelligence.

A Conference was held on October 30, 1908, at the University on the question of organising a contingent of the Officers' Training Corps in the University. The Vice-Chancellor (Sir William Collins, M.P.) presided. Colonel Heath, C.B., Captain, J. T. Burnett-Stuart, D.S.O., and Colonel H. E. R. James, F.R.C.S., represented the War Office, and the company included members of the Senate, representatives of the Schools of the University, including the Medical Schools, and of the students nominated by the Student Societies and by the several Schools of the University. The Principal of the University (Dr. H. A. Miers) also attended. The Vice-Chancellor said that the University was fully in sympathy with the policy of the War Office in establishing an Officers' Training Corps, the chief object of which was to supply officers for the Territorial Army and for the Reserve of Officers. The shortage of officers which revealed itself during the South African War, when 2,000 additional officers had to be obtained in fifteen months, called for some action on the part of the War Office, and he recollected with pleasure that the University of London in that crisis had been able to assist the War Office by nominating several graduates for commissions. It was a satisfactory feature of the Regulations for the Officers' Training Corps that the Universities would be associated with the public schools in the organisation of the corps. As regards finance, he trusted that the War Office would be generous in the grants which it would make to the

University towards the expenses connected with the organisation of the Corps. Colonel Heath gave an outline of the Regulations for the Officers' Training Corps and referred to what had already been done in the matter by other Universities. After discussion, during which the representatives of the War Office answered the questions which were raised, the following resolution, proposed by Dr. Gregory Foster, Provost of University College, and seconded by Mr. H. J. Harris, of University College, was carried unanimously: "That this meeting requests the Senate of the University to take the necessary steps for constituting a Committee of Military Education, in accordance with the regulations for the Officers' Training Corps, with the view of establishing in the University a contingent of that corps."

Courses of instruction in military subjects, intended primarily for students preparing for the commissions in the Army for which the University nominates, will be given at the University by the military instructors, Colonel Sawyer and Colonel Maude, C.B. Inaugural lectures, to which admission was free, were delivered in the week beginning Monday, November 23, as follows: By Colonel Sawyer: Military History and Strategy, Monday, at 5.30 p.m.; Military Topography, Monday, at 6.30 p.m.; Tactics, Thursday, at 5.30 p.m.; Military Law and Administration, Thursday, at 6.30 p.m. By Colonel Maude, C.B.: Military Engineering, Wednesday, at 5.30 p.m. None of the courses will be continued after the first lecture unless ten students present themselves in the subject.

## MILITARY COOKERY.

THE annual competitions for the Military Challenge Shield took place at the Nineteenth Universal Cookery and Food Exhibition held at the Royal Horticultural Hall, Westminster, from November 3 to 7. The competitions included practical demonstrations in cookery on a large and economical scale, and created a very keen and healthy rivalry amongst the teams competing for the respective shields, and also much interest on the part of the general public, who were allowed to witness the men's cooking.

*Military Hospitals Challenge Shield.*—For the first year, a competition amongst the trained cooks of the military hospitals at home took place at this exhibition, and it is gratifying to know that it was attended by very good results in sick cookery. In consequence of the great importance attaching to this subject in military hospitals, and with the view of encouraging increased proficiency in the art, a shield has been recently approved by the Army Council for annual competition amongst the cooks of the Royal Army Medical Corps at the Cookery and Food Exhibition. Two N.C.O's. or men of the cooking section of the corps, from hospitals where superintending cooks are employed, are allowed to compete, but the latter are not permitted to take any part in the competition. The winners of the shield are also awarded silver medals, and the superintending cook in charge a special silver medal and diploma. The second team receive bronze medals, and, according to results, special prizes are also awarded to the superintending cooks of the teams adjudged second and third in order of merit. The competition consists in practical tests in preparing various dishes, before judges and the public, from the several articles comprising the different diets in military hospitals, and points are awarded by the Association jurors for practical knowledge, method of work, cleanliness in work, economy in materials and utensils, and excellence of result when cooked and ready for serving, including flavour and appearance. Two hours are allowed for the preparation of the dishes, but points are also given for smartness and efficiency. For this year, competitors had to draw for two menus from a list of eight dishes, consisting of thirty-one items in all. Seven hospitals entered teams for the competition as given below, in order of merit, and a very close contest took place between the Queen Alexandra Hospital and the Connaught Hospital for first position, the former just winning by three points. In fact, the results were so excellent that, so we understand, the judges consider they are justified in recommending the grant of a special prize to the second team. Results: No 18 Company, R.A.M.C., the Queen Alexandra Military Hospital, Millbank, S.W. (winners of the shield and silver medals), 382 points, 1; No. 2 Company, R.A.M.C., Connaught Hospital (winners of bronze medals), 379, 2; No. 10. Company, R.A.M.C., Chatham, 341, 3; Nos. 4 and 5 Companies. R.A.M.C., Netley, 319, 4; No. 7 Company. R.A.M.C., Devonport, 312, 5; No. 12 Company, R.A.M.C., Royal Herbert Hospital, Woolwich, 310, 6; No. 6 Company, R.A.M.C., Alexandra Hospital, Cosham, 308, 7.

We have been favoured with the remarks of the judges as applied to the efforts of the first team (Privates Ferdinando and Goodwill), as follows: "Showed thorough training thoroughly grasped the idea of invalid cookery. Dainty, appetising, and exceedingly well cooked. Puddings perfect." Such remarks from such well-known and expert judges, amongst whom were Messrs. Escoffier and Cédard, are very encouraging, and must be particularly pleasing to the officer commanding the hospital to which the men belong, especially so to Captain J. B. Short, R.A.M.C., the quartermaster under whom they have been trained, and who, we understand, is the prime mover and originator of this competition. Having qualified, by examination, in sick cookery, this officer is competent to instruct others in this most important duty, which is so closely allied to the treatment of patients. Mons. Cédard (principal chef at Marlborough House) also remarked that he would have had no hesitation in sending the puddings prepared by Privates Ferdinando and Goodwill to the Royal table. These two men also submitted trays in the "Invalid Tray Competition," and were awarded respectively a bronze medal and a certificate of merit. Individually, Private Fowles, of the Connaught Hospital, obtained the highest points in the competition for the shield.—(Extract from the *Broad Arrow.*)

## BIRTHS.

POLLOCK.—On October 25, at Valletta, the wife of Major C. E. Pollock, R.A.M.C., of a son.

RITCHIE.—On November 4, at 37 Thorndale Avenue, Belfast, to Captain and Mrs. T. F. Ritchie, a daughter.

WANHILL.—On November 13, 1908, at Beverleys, Spring Grove, Isleworth, to Major and Mrs. Wanhill, a son.

## MARRIAGES.

COATES.—KNEE.—At the Cathedral, Bombay, on October 14, 1908, by the Venerable the Archdeacon of Bombay, Captain T. S. Coates, R.A.M.C., eldest son of T. Coates Esq., Waltham, Lincolnshire, to Nellie Rose, second daughter of Thomas Knee, Esq., The Acre, Stroud, Gloucestershire, and late Military Nursing Service, India

HYDE.—MAUDUIT.—On October 29, at Melton Mowbray, by Rev. Canon Blakeney, M.A., R.D., Vicar of Parish, Captain Dermot Owen Hyde, R.A.M.C., son of late Brigade-Surgeon Lieutenant-Colonel R. Hyde, A.M.S., and of Mrs. Hyde, Aberlour, Palmerston Road, Dublin, to Hilda Edith Richmond, elder daughter of Major F. R. C. M. de R. Mauduit, Indian Army.

O'BRIEN-BUTLER—O'BRIEN.—On October 17, at Rushbrooke Convent Church, Queenstown, Co. Cork, by the Rev. D. O'Connor, C.C., Paget O'Brien-Butler, R.A.M.C., elder surviving son of Major Pierce O'Brien-Butler, late 60th Rifles, to Mary Winifred, only daughter of Lieutenant-Colonel Henry J. O'Brien, A.M.S., retired, of Weston, Queenstown.

## EXCHANGES, &c.

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# Notices.

## EDITORIAL NOTICES.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts, and commands at home and abroad.

**All such Communications or Articles accepted and published in the "Journal of the Royal Army Medical Corps" will (unless the Author notified at the time of submission that he reserves the copyright of the Article to himself) become the property of the Library and Journal Committee, who will exercise full copyright powers concerning such Articles.**

Matter intended for the Corps News should reach the Editor not later than the 15th of each month for the following month's issue. Notices of Births, Marriages, and Deaths are inserted free of charge to subscribers and members of the Corps. All these communications should be written upon one side of the paper only; they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed The Editor, "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS," War Office, Whitehall, London, S.W.

Communications have been received from Lieutenant-Colonel E. M. Wilson, Major R. J. Blackham, Lieutenant-Colonel R. J. S Simpson, Lieutenant-Colonel R. H. Firth, Major H. W. Grattan, Captain J. E. H. Gatt, Major C. G. Spencer, Major C. F. Wanhill, Captain F. J. Ritchie, Staff-Surgeon W. W. Pryn, Field-Marshal Sir Evelyn Wood, Captain N. E, Norman, Lieutenant-Colonel J. R. Forrest, Captain J. Matthews, Captain A. B. Smallman, Captain G. S. C. Hayes, Captain H. Ensor, Captain R. B. Ainsworth, F. G. Bushnell, M.D., and Major G. Dansey Browning, Lieutenant-Colonel A. E. Wear, R.A.M.C.(T.)

The following periodicals have been received:—

*British: The Hospital, The Army and Navy Gazette, The British Medical Journal, Guy's Hospital Gazette, The Agricultural Journal, The Royal Engineers' Journal, St. Bartholomew's Hospital Gazette, Journal of the Royal Sanitary Institute, The Lancet, Journal of the United Service Institution of India, The Indian Medical Gazette, The Medical Press and Circular, St. Thomas' Hospital Gazette, The Journal of Tropical Medicine and Hygiene, Red Cross News, The Medical Review, Public Health, On the March, The Practitioner, Sleeping Sickness Bureau, Journal of the Royal United Service Institution, Quarterly Report on the Progress of Segregation Camps and Medical Treatment of Sleeping Sickness in Uganda, Report of the Army Veterinary Service, The Australasian Medical Gazette, The All-Indian Hospital Assistants' Journal, Transvaal Medical Journal.*

*Foreign: Sanitätsbericht über die Marine-Expeditionskorps in Sudwestafrica,* 1904-05, *Boletin de Sanidad Militar, Revista de Sanidad militar y La Medicina militar Española, Le Mois Médico-chirurgical, Giornale di Medicina militare, Le Caducée, Der Militärarzt, Annali di Medicina Navale e Coloniale, Deutsche Militärärztliche, Archiv für Schiffs- und Tropen-Hygiene, Archives de Médecine et de Pharmacie militaires, American Medicine, Bulletin of the Johns Hopkins Hospital, Avance à la Antropologia Militar de Espana, Archives de l'Institut Pasteur de Tunis, Pathologica, Japanese Medical Journal, Bulletin de l'Institut Pasteur, Norsk Tidsskrift for Militaermedicin, Archives de Médecine Navale, Russian Medical Journal.*

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